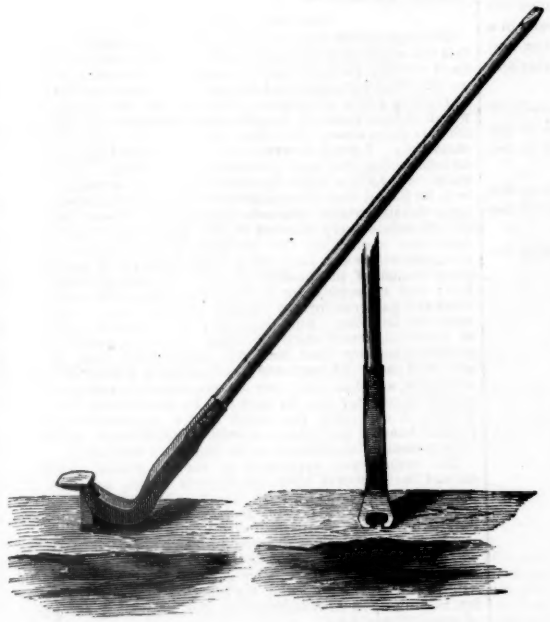
RAILROAD GAZETTE

SATURDAY, JULY 13 1872.

Parkinson's Spike-Drawer.

Mr. Peter C. Parkinson, of Marquette, Mich., has taken out a patent, dated April 2, 1872, for an implement for drawing railroad spikes which is shown so clearly by engraving that a description is hardly necessary. The idea is to make a convenient and simple tool which will draw a spike without bending it or enlarging the hole in the tie. With a fixed fulcrum, such as that of an ordinary hammer in drawing a nail, the motion of the claws holding the head is not vertical, but curves



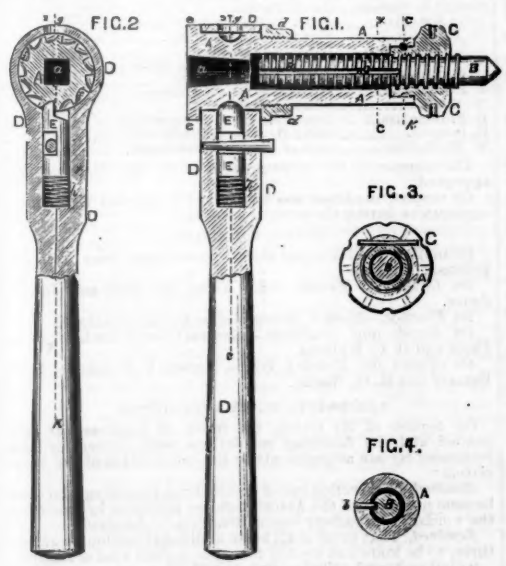
in the direction the long arm of the lever, or handle, is moved. This of course tends to bend the nail or spike. But in the tool illustrated the fulcrum, or the part which rests on the tie, is curved, and as the claws are raised by depressing the handle end, the fulcrum slips and approaches nearer and nearer to the spike, so that the motion of the claws continues vertical, and the spike is lifted perpendicularly from its place, leaving it straight and fit for further use, and the hole from which it was drawn clean and smooth.

We have been informed by a track-master who has used this tool that it works admirably, and is a very convenient and economical addition to the implements of the section-man.

Improvement in Ratchet Drills.

The above very neat arrangement has been patented by John J. Switzer, of Williamsburgh, New York. He describes the invention in his specifications as follows:

A in the drawing represents the drill-stock or tube, containing a socket, *a*, for the reception of the drill, and containing also the "center" *B*, which projects from its further end. The "center" is a screw, entering the hollow stock *A*, and grooved lengthwise to receive the end of a pin, *b*, which projects inwardly from *A*, and prevents the screw from turning. The



feed-nut *C* is swiveled to the end of the tube *A* and is threaded to fit the screw *b*, so that by turning said nut the screw will be caused to slide in or out, but without turning. This feature of a sliding center, I consider a valuable improvement of the feeding device now in use, as it is plain and simple and admits of considerable length of feed. *D* is the handle of the drill, formed with an eye at the upper end to embrace the tube *A*. A nut, *d*, and shoulder, *c*, serve to confine the handle on the tube, allowing it, however, to turn thereon. The nut *d* is screwed upon the tube. Whenever it is removed the handle can be drawn out, not otherwise. That portion of the circumference of the tube *A* which is contained within the eye of the handle *D* is provided with a succession of notches or depressions, *F F*, which constitute the ratchet-head. The spring pawl *e* is contained within the handle and entirely connected with the same. It is introduced through an aperture, *g*, of the eye before the handle is applied to the tube *A*. The end of the pawl *F* is, by the spring *h*, forced against the ratchet-head, and slips in the notches of the same when the handle is turned in one direction, while, when the handle is turned in the other direction, it takes firm hold and turns the tube and drill with it.

The forming the ratchet-head in the body of the tube *A* by depressions is a great advantage over the usual method of forming projecting teeth. It is stronger and protects the bearing surface of each tooth at the sides, similar to a flanged ratchet-wheel, but is much cheaper to make than the same. The forming the handle and eye in one piece and providing a chamber in the handle for the pawl and spring is also a more economical and simple plan than any hitherto in use.

The Late F. R. Firth.

The Worcester *Gazette* publishes the following sketch of the life of this brilliant young man, late Chief Engineer and General Superintendent of the Atchison & Nebraska Railroad, whose untimely death by an accident on his road we recorded recently:

He was a graduate at the Worcester High School, and was a thoroughly educated civil engineer. He was offered almost any desirable situation here, if he would remain at home, but he was ambitious for a wider field and went to the West, where his ability soon asserted itself and secured to him the confidence of railroad managers of greater age and experience, and the situation of General Superintendent of the line on which he was killed. He had hardly entered upon manhood, being only 25 years of age at his death. A line of road, a hundred or more miles in length, the Atchison & Nebraska Railroad, was under survey, and without letters of introduction, he applied to the engineer for a place in the surveying party. He was slender and frail-looking, and the answer was discouraging; the work was hard and rough, and he was thought not physically adequate to it. In answer to a question as to what he could do, he modestly suggested that perhaps he could "carry a chain," and he was hired to do this at $45 per month wages. He went out, and through a long siege of wild life in the open air, through swamps and hills and forests, he held his own with his more sturdy companions; careful and temperate in habit, he avoided disease, and not only did his own work, but was of much service caring for his companions who fell sick from time to time. From the first the engineer was surprised to find that while all his former chain-bearers needed much instruction, Frank seemed to go to the right spot the first time, as if by intuition, but in answer to any such suggestions Frank made no revelation of his former studies. At length the party were within thirty miles of the end of their route, when nearly all fell sick; the engineer was prostrated, and it was suggested to abandon the work and turn back. The engineer said to Frank that this must be done, that there were two or three days' work minuted on the field books which must be worked out and tabulated before they could go further, that he was too sick to do it, and that even if it was done they were in a broken and hilly country through which he was doubtful of penetrating with a practicable line. Frank heard him through and offered his assistance, asking that he might take the figures, and try to tabulate them. The engineer expressed doubts of a chain-bearer being able to do such work, but being further urged he consented, and Frank took the books, while the company lay by in the camp. In a few hours, he laid before his superior the results of his work, every level, every point of compass, every detail of the survey correctly worked out, and in its place, ready for the continuance of the work. The engineer was astonished, but perhaps not more so than when Frank offered to take up the work at that point, with the few well men that were left, and push through the hills, leaving his superior and the other invalids to recuperate. He was allowed to go on, and he accomplished the work to the entire satisfaction of the engineer, and on returning to headquarters, the latter told the story, declaring to the President and board that but for "that boy" their proposed line would have been a failure. Frank was rewarded on pay-day by one hundred dollars per month for his work, instead of forty-five dollars as he had expected, and soon after he was placed in charge of the construction of the line as Chief Engineer; at the completion of the road he was made its Superintendent, having won his way by his own quiet but determined energy. He was greatly beloved and respected by all with whom he was associated, and was held in the highest esteem by railroad men of large experience, as the most remarkable and promising young man they had ever seen. His untimely death is a cause of sincere sorrow, not only to his immediate family and friends, but to an unusually large circle of business acquaintances. His remains were to be interred at Atchison, Kansas, but will doubtless be brought east for final sepulture.

Estimating the Speed of Trains.

The *Journal of the Franklin Institute* says:

"Several devices have been contrived to register the speed of trains, but none of sufficient simplicity to come into general use have yet been suggested.

"Messrs. Samman & von Weber's construction, a German invention, consists of a disc driven by clock-work and a recording pencil. While the train is halting this describes a circle, but during the journey a crooked line is produced by the vibration.

"In M. Cremer's apparatus, a strip of paper moves by clockwork. This paper is graduated and marked in minutes. A needle, with an up and down motion, which is in connection with an axle, pricks the paper. The distance of the holes serve as a guide in calculating the speed. In French railways a contrivance is met with, in principle not unlike the centrifugal governor, the coupling-box of which is in connection with and moves a pencil. In Shiff's apparatus, which is not unlike that of Cremer, the needle is moved by a battery, which renders itsworking more complicated and uncertain."

Contributions.

Thoughts on the Rail Question.

To the Editor of the Railroad Gazette:

The demand for better rails is the outgrowth of an absolute necessity, having its inception in the greater weight of rolling stock and higher speed that of late years have come into vogue, and these last have their origin in commercial conditions too remote and too complex to call for or be capable of consideration here. It may therefore be taken as a truism that no matter what the cost to railroad companies or what difficulties have to be overcome by manufacturers, improved rails will be called for until a product of greater strength, durability and safety than now ordinarily obtains shall be brought into common use. This, of course, must come about through two agencies, the employment of better material and the introduction of more careful methods of production. The former of these is evident in the rapid adoption of steel rails, but the latter is capable of much further development, in the manufacture of rails, both wholly of steel and wholly of iron, but more especially in the combination of the two, a system suggested in a score of alleged improvements, of which not more than two or three at the utmost have given any tangible proofs of utility.

Under like conditions, and with the relative cost taken into full consideration, there can be no doubt of the superior durability of steel rails as compared with iron. But there is reason to be incredulous as to the entire fairness of the ordinary estimate made of their comparative worth, the best steel product being laid down for testing, and the result brought into flaring juxtaposition with the average obtained from iron of ordinary—too often very ordinary—quality.

Now it is obvious that there may be as many grades of steel rails as of iron. With the Bessemer product, so small a quantity as one-fiftieth of one per cent. of phosphorus will make the metal brittle, and the same defect will come from any excess of silicon. Take into consideration the fact that but few ores in this country will yield a metal purer than this, and that the same desirability of cheapness, to call it by no stronger phrase, will be shown by the purchaser in buying steel as well as in the purchase of iron rails, and the source of danger to life and property from broken rails will scarcely be diminished, if reliance be placed upon the mere substitution of the one material for the other. Tending to this result with steel even more than with iron is the liability to breakage at punched fish-plate holes and nicks in the flanges. But it must be confessed that these difficulties are apparently as great with what, theoretically, is one of the very best types of a perfect rail—that made of cast steel, of which thirty thousand tons annually turned out from Krupp's steel works, are laid down annually on European lines. A rail of fibrous iron with a thin steel top would furnish the requisite of combined safety and permanence, but the making of this is one of the unsolved problems of metallurgists and rolling-mill managers. Rails have been made with a steel cap so firmly welded that their junction could only be shown by the different tints given to the two metals by the application of acids. But the same causes that produce lamination in a poorly made rail of the ordinary kind tend to separate the caps from the rail, in which the cause just mentioned is doubtless aided by unequal expansion and contraction by changes in temperature. Some years since, the simple case-hardening of the upper surface was proposed, and there is enough of plausibility in the plan to recommend it for trial, but the manufacture of rails on this plan would involve rather complex operations, on a scale hitherto unprecedented, and by workmen unfamiliar with operations of the kind, and, during the infancy of the manufacture at least, would be so costly as to afford small margin for profit. It would not be surprising, however, if in this case, as in some others, chemistry should be found available in producing results which purely mechanical appliances have failed to provide. Meanwhile, the weight of locomotives and of cars is year by year being increased, and the greater the speed of trains, whether passenger or freight, the better pleased is their great patron the public. To meet these conditions, the rails must be heavy, strong, tough and hard on top. The greater the weight of a costly material, the slower will be its introduction; but any probable increase in the number of pounds per yard of iron rails, however much of a bugbear a decennium since, will be a minor consideration when it is found that more substantial permanent way is absolutely required. It would be well if, while Bessemer steel men are showing praiseworthy energy in securing the favor of railroad managers for the new rails, iron manufacturers should try to find whether all has been done that can be done to furnish a fibrous rail that will exceed steel in the matter of toughness, and yet, for an inch in thickness at its wearing side, have the hardness that resists abrasion from the wheels. And if they will take as a starting point an iron rail as good of its kind as the steel rails which have afforded the data upon which the advocacy of the latter is founded, the prospects of success in the line indicated will be found much brighter than will appear at first.

"Sighting in Ties"—Measuring for Joint-ties.

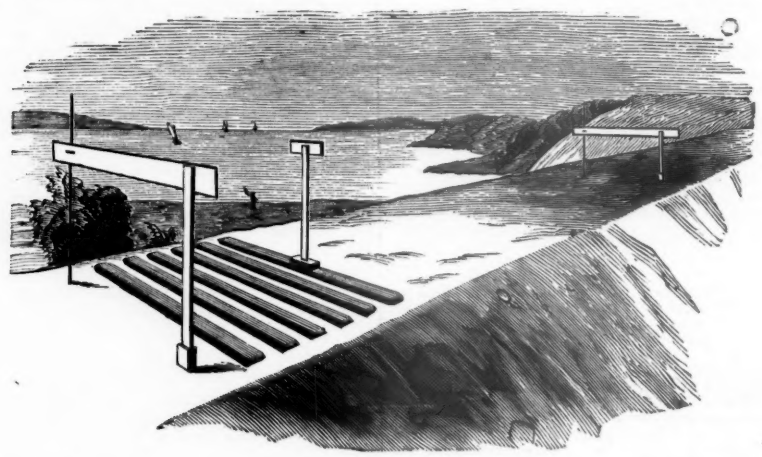
BY WM. S. HUNTINGTON.

Almost every one has a "way of his own," of doing certain kinds of work, and every one considers his method the best. It is the practice of some engineers to set grade stakes 20 feet apart for laying ties. This is unnecessary labor for the engineers, and moreover it is inconvenient for those who lay the ties. The men who lay the leading ties must handle a straight-edge 21 feet in length, which is difficult to manage, especially in windy weather. It is a slow and tedious operation to place each end of a straight-edge on the grade stakes. A more ready

method of laying the "leading ties" is to "sight them in" by the use of "target boards." These boards are shown in the annexed cut. They are constructed by taking a board *A*, eight or ten inches in width, and the length of the ties to be laid. Near one end a leg, *B*, 3½ or 4 feet in length, made of a strip of board, is fastened. At the same distance from the other end is a clasp and thumb-screw, *S*. An iron rod, *D*, passes through the clasp and is driven into the ground far enough to support the board steadily. Two boards like fig. 1 are required, and they should be painted white with a black stripe half an inch wide on the upper edge.

With this arrangement it is only necessary to set one grade-stake opposite each center-stake, 100 feet apart. Place the leg *B* of the target-board on the grade-stake *C;* then drive the rod *D* into the ground sufficiently to hold the board steadily. If on straight line, level the board and secure it in place by the thumb-screw *S*. If on a curve, first level the board, then elevate the required distance by the ¼ inch, ½ or inch marks, *M*, on the rod *D*. Place another board like this at the next grade-stake, and you are now ready to proceed. The target *E*, fig. 2, is made by morticing a standard into a block. A crosspiece at the top of the standard is painted like the board *A*. Place this upon the tie after it is in place. Of course if the top of *E*, when placed on the tie, coincides with the two boards *A*, the tie is right. A sprightly lad ten or twelve years old can, after a little practice, sight with great accuracy and rapidity.

By this process the leading ties can be laid near enough together so that a short straight edge may be used to lay the intermediates. When sufficient leading ties have been laid between the target-boards, the rear board may be moved ahead, "jumping" the other board, like playing checkers. The distance between the leg *B* and the rod *D* should be equal to the



gauge of the track. On curves the grade-stakes should be set on the inner side.

This method relieves the engineers of an immense amount of unnecessary labor, and tracklayers who have tried the plan prefer it to any other.

MEASURING OFF FOR JOINT TIES.

This should be done with great care, and, if nicely done, will not only save much labor and trouble in tracklaying, but will tend greatly to prolong the life of rails and reduce the expense of track repairs. If the iron "runs ahead" of the marking, the joint-tie must be moved ahead, or the joint will not be in the center of the tie and will cause a "cocked joint," which will expose the ends of the rails to unnecessary wear by "pounding." If the marking runs ahead of the iron, it is necessary to move the joint-tie back; and in either case it brings the joint-tie nearer to one side-tie than the other, which is sure to cause a "cocked joint," by which the rails will soon be spoiled. When it is necessary to move the joint-tie, the side-ties should also be moved, to bring them equal distances from the joint. This will not only prevent the wear of rails at the joint, but will save much expense in track repairs.

The ties should not be laid far in advance of the rails, as it is convenient in measuring for joints to go back occasionally and measure from the end of the rails and correct the measurement, which will obviate the necessity of moving ties after being once laid. The measuring pole or rod should be as long as the target rail. The length of shorter rails may be marked on the pole. The joint stakes should be made square and straight. Set the stake ahead of the end of the pole (or the marks, if for short iron), just the distance that is allowed for expansion, and by driving the stakes perpendicular and firm the measurement will be correct. By exercising a little care to place the stakes in line, the measuring will be more accurate than when driven zig-zag. In laying track on curves it is necessary to cut the inner rail occasionally to keep the joint radial to the curve. In such cases the measuring pole must be "set back" as much as is taken off the rail. The man in charge of laying the iron should keep watch and notify the "marker" when the iron has run ahead far enough to need cutting. The marker can thus act understandingly.

A Train Telegraph.

LAWRENCE, Kansas, July 1, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A very important invention by Vincent B. Bell, Auditing Clerk in the general office of the Leavenworth, Lawrence & Galveston Railroad Company, was tested here in the presence of a number of prominent railroad and scientific gentlemen, on the 26th ult., and pronounced a decided success.

It will undoubtedly supply a long felt want, and in time be adopted into general use.

A great many unsuccessful efforts have been put forth, and expense incurred by managers and superintendents of railroads throughout the country to devise some means by which the many disastrous accidents from the breaking in two of trains, and especially heavy freight trains, on their lines of road, may be averted.

Engineers pulling long heavy trains over a track abounding in curves and cuts, hemmed in by bushes and timber, and particularly at night, can see the whole of their trains but a small fraction of the time, and, by varying grades, are liable to break a coupling, and as frequently happens, proceed some distance before the discovery is made; and then, if on down grade, are obliged to run ahead to prevent the disconnected section from colliding.

The number of this class of accidents is legion, and they are daily recurring. Mr. Bell's patent combines the requisites of durability, accuracy, simplicity and economy. It consists of two alarm boxes, and a local Daniells' battery of two cups, such as is used at small telegraph stations, and is a model of compactness, the whole battery being enclosed in a tight box 12 by 14 by 10 inches, a sole-leather cup being substituted for the ordinary earthen porous one, and that is enclosed in a square copper jar or receiver, fitting snugly in the box and having a small corked hole at the top to renew water and vitriol by.

This box is to be placed in the caboose of a freight train, or in the baggage car of a passenger train, and attached to the side of the car by adjustable cleats, which will admit of its being taken out readily.

Two brass rods, one attached to each pole of the battery, are forced out against two small plates attached to the side of the car by concealed springs imbedded in the box.

Two wires are attached to this battery and passed under the entire train to the cab of the engine, where they are joined together, thereby forming a circuit. Near the engineer's head, on the cab, one of the alarms is placed. The wires, in passing under the train, are securely tacked to the bottom stringers of the cars; and at each coupling they are fastened beneath the draw-head, and both wires are combined into one pliable copper cable, covered and duly protected from the weather or contact with surrounding metal, and are joined together by an ingenious spring snap or plug, which admits of separate action through them of the adverse poles of the battery.

One alarm is placed in the most accessible place in the caboose, and the other on the engine as aforesaid. They are inclosed in a box about 8 by 4 by 5 inches and are constructed as follows: Two magnets, or helices, with an armature playing between a spiral spring and the magnets, as in a telegraph instrument, are placed in one end of the box, and a simple gearing, constructed on the principle of a clock-alarm, at the other.

The armature is connected with the ratchet of this alarm, and so acts that when the circuit is closed the armature is held firmly against the magnet, and the instant the circuit opens at any point the armature flies back and pulls the ratchet of the alarm, which continues to sound until run down, unless stopped by some person or by the closing of the circuit.

This alarm is kept wound up by a few turns of a key, and will run for three hours in succession.

Another important advantage in this alarm is the unequalled facilities for communication between the front and rear of the train. A small rod projects out of the alarm box, which, being pressed upon, opens the circuit and sounds the alarm at both ends of the train simultaneously. Thus the conductor is in quick communication with his engineer at all times, and on passenger trains it entirely dispenses with the bell-cord, as one of these small circuit rods could be attached at either or both ends of a coach.

To keep this entire apparatus in good condition requires the same attention as a local in a telegraph office, and is not as much trouble on passenger trains as a bell cord.

The estimated first cost of this equipment is probably as follows: For engine, $25; for battery and alarm for caboose or baggage car, $60; and $3 per car or coach in the train.

On the 21st of March, 1871, M. Prudhomme took out a patent on a similar apparatus, but from the drawings of it I should consider it entirely impracticable for many reasons, some of which are: It requires a battery to each car; if a train was to break in two in the middle, no alarm would be sounded, as there are too many breaks in the circuit (two to each car); and again, the wires are attached between the cars in two places, making a great inconvenience in coupling and uncoupling cars.

Again, if the train breaks in two, it is constructed so as to close the circuit instead of open it, as in Mr. Bell's patent.

J. A. DAVIS.

THE MASTER CAR-BUILDERS' ASSOCIATION.

Full Report of the Sixth Annual Convention.

For the following, which is the fullest report made of the Convention and revised by officers of the Association, we are indebted, and very much indebted, to the *National Car-Builder*:

The delegates to the Sixth Annual Convention of the United American Railway Master Car-Builders' Association assembled on the 12th of June, proximo, at the Southern Hotel in the city of St. Louis. The convention was called to order at nine o'clock a. m. by the President, M. C. Andrews, of the New York & New Haven Railroad. The Vice-President of the Association, Mr. M. P. Ford, not being present, the Chair announced that the first business in order would be an election to fill the vacancy.

Mr. Joseph Jones moved that the vacancy be filled by the appointment of Hugh Gray, of the Chicago & Northwestern Railway, which motion was unanimously agreed to, and Mr. Gray, thereupon took his seat as Vice-President *pro tem.* After a brief recess for the purpose of examining models and drawings, the Chair again called the Convention to order, and delivered the following address:

THE PRESIDENT'S ADDRESS.

GENTLEMEN OF THE CONVENTION: I congratulate you upon this the sixth annual meeting of our Association. The time fixed for the present meeting, and in accordance with which we have this day assembled, has proved to be an unfortunate one as regards a full attendance, inasmuch as the Boston Jubilee will doubtless make it inconvenient for many of the railroad officials to be absent from their respective posts of duty at the same time. I trust, however, that our present meeting will be an interesting one, and productive of important practical results. We have a large amount of business to transact, and it is to be hoped that the realization of this fact, and its bearing upon the important interests represented by our Association, will stimulate every member in the performance of the duties devolving upon him. We are here for the purpose of interchanging views and suggesting improvements in regard to the great branch of mechanical industry with which we are identified; and especially for establishing approved and uniform sizes and patterns for the various parts of cars, so far as the same can be done. The passenger and freight rolling stock of our roads travel such immense distances, and run over so many connecting lines, that the adoption of some system of standard sizes and patterns has become a matter of absolute necessity, so that cars can be economically and speedily repaired, no matter how far they may be from where they belong. I think it especially important that a standard size of axle, journal-bearing and oil-box should be established, as they are only second in importance to the height of draw-bars.

The committees appointed at the last annual meeting will submit their reports upon the various topics assigned them, and these reports will, I trust, receive the earnest attention of the Convention. I do not feel it necessary to dwell upon details, or occupy your time with a long address. As my worthy predecessor remarked upon a former occasion, I feel more competent to handle the mechanical rule than to administer rules of parliamentary practice as your presiding officer; but I will discharge the duties of my position to the best of my ability, relying upon your indulgence and support in the progress of our deliberations.

COMMITTEES.

On motion of Mr. F. D. Adams, the following committees were appointed by the chair:

On Credentials.—Messrs James T. Leighton, M. Wilder and J. Ferris.

On Communications.—Messrs. F. D. Adams and R. S. Ramsey.

MEMBERS PRESENT.

The roll was then called, and the following members answered to their names:

Joseph Jones	New York Central & Hudson River	N. Y.
Enos Varney	Fitchburg Railroad	Mass.
F. D. Adams	Boston & Albany	Mass.
Leander Garey	New York & Harlem	N. Y.
A. Steinbach	Philadelphia & Reading	Pa.
Henry Scriba	Pitts. & Connellsville	Pa.
R. S. Ramsey	Pennsylvania Railroad	Pa.
H. O. Wadlia	Illinois Central	Ill.
Hugh Gray	Chicago & Northwestern	Ill.
R. V. Coon	Troy & Boston	Mass.
C. Woods	Union Line Tr. Co	Pa.
James McGee	Pitts., Cin. & St. Louis	Ohio
D. Hoit	Toledo, Wabash & Western	Ohio
W. H. H. Allison	Cin., Hamilton & Dayton	Ohio
R. Reniff	Chicago & Alton	Ill.
George Hackett	Central of New Jersey	N. J.
E. A. Olmstead	Long Island Railroad	N. Y.
William Johnson	New York Central & Hudson River	N. Y.
M. C. Andrews	New York & New Haven	N. Y.
H. Kirmse	Pittsburgh, Cin. & St. L	W. Va.
J. H. F. Wiers	A. & G. Western	Pa.
R. D. Cole	Atlantic & W. Point	Va.
A. Steinbrunner	Cleveland & Pittsburg	Ohio
George E. Stevens	Union Pacific	Neb.
John Marquis	Pitts. F. Wayne & Chicago	Pa.
W. F. Smith	Cleve., Col., Cin. & Ind	Ohio
J. L. Hackathorn	Kentucky Central	Ky.
W. W. Wilcox	Chicago, Burlington & Quincy	Ill.
D. S. Docksiader	Atlantic & G. Western	Pa.
J. J. Kirkland	Pitts., F. Wayne & Chicago	Ohio
W. B. Snow	Illinois Central	Ill.
H. F. Douglass	Late of N. Haven & Northampton	Ct.
H. Longest	Rich., Danville & Piedmont	Va.
W. W. Bedient	Late of Danbury & Norwalk	Ct.

The minutes of the last annual meeting were then read and approved.

On motion, the Chair was authorized to appoint all regular committees during the present session.

SPECIAL COMMITTEES.

On motion, the following special committees were then appointed:

On Circulars.—Messrs. John Kirby, D. Hoit and Joseph Jones.

On Finance.—Messrs. James McGee and A. Steinbach.

On Models and Drawings.—Messrs. George Hackett, S. A. Davis and H. C. Whiting.

On Officers for Ensuing Year.—Messrs. F. D. Adams, R. S. Ramsey and H. O. Wadlia.

AMENDMENTS TO THE CONSTITUTION.

On motion of Mr. Garey, the order of business was suspended, and the following resolutions were offered by him proposing certain amendments to the constitution of the Association:

Resolved, That section one of article three, providing who shall become members of the Association, be amended by inserting the words, "and railway superintendents." Adopted.

Resolved, That there shall be an additional section to article three, to be known as section four, which shall read as follows:

"Civil and mechanical engineers and others whose qualifications and experience may be valuable to the Association, may become associate members when recommended by a supervisory committee. All associate members must be elected by ballot at a regular meeting, and five dissenting votes shall reject. Associate members shall be entitled to all the privileges of active members except the privilege of voting." Adopted.

Resolved, That section three of article three be amended so as to read as follows:

"All members will be liable to assessment for annual dues to defray the necessary expenses of the Association, as decided at each annual meeting; and each one signing or causing to be signed the constitution will be considered a member until he voluntarily resigns." Adopted.

Mr. Garey moved to amend the title of the Association, which now reads, "The United American Railway Master Car-Builders' Association," so that it will hereafter read, "The Railway Master Car-Builders' Association," and stated in support of his motion that the title was too long, and that the words "United American" were superfluous.

Mr. Adams moved to amend the amendment by striking out the word "Railway." He had always been dissatisfied with the title, and would prefer to write it in full, with the additional words, "of the United States and Canada," so as to include this entire end of the continent, or else cut it down and make it as short as possible.

Mr. Garey accepted the amendment: and his original motion, as amended, was agreed to, so that the name of the Association is now "The Master Car-Builders' Association."

NEW MEMBERS.

The following gentlemen then signed the constitution, and became members of the Association:

S. Griffith	Ind., Cin. & Lafayette	Ohio
Joseph Townsend	Missouri, Kansas & Texas	Mo.
W. B. Phelps	Fourth Avenue Street Line	N. Y.
S. A. Davis	Boston, Lowell & Nashua	Mass.
C. J. Hobach	Catasauqua & Fogelsville	Pa.
J. W. Sauerbach	Cleveland & Pittsburgh	Ohio.
James T. Leighton	New Haven Car Co	Ct.
M. Wilder	Erie Railway	N. Y.
John Ferris	Housatonic Railroad	Ct.
J. C. Buckhout	New York & Harlem	N. Y.
Josiah Stahl	Mo. R., Ft. Scott & Gulf	Mo.
George Rowe	New York Cen. & H. River	N. Y.
J. W. Holmes	A & Great Western	Pa.
W. H. Johnson	New Orleans, Mobile & Texas	La.
John Kirby	Lake Shore & Michigan So.	Ohio.
R. B. More	Ind. & St. Louis	Ill.
C. S. Buck	St. Louis, K. City & Northern	Mo.
Oscar Doolittle	St. Louis & Iron Mountain	Mo.
W. H. H. Price	Evans, Henderson & Nash.	Ky.
H. E. Smith	Des Moines Valley	Iowa
F. S. Tull	Houston & Texas Central	Texas.

TREASURER'S REPORT.

The report of the Treasurer of the Association was then presented and read by the Secretary, as follows:

Amount received	$818 95
Amount expended	326 14
Balance on hand	$492 81

AARON STEINBACH, *Treasurer.*

DICTIONARY OF TERMS.

The committee on this subject, appointed at the last annual meeting, consisting of Messrs. F. D. Adams, M. C. Andrews, Leander Garey, A. Steinbach, C. A. Smith, Joseph Jones, and I. W. Van Houten, made a report through their Chairman, Mr. Adams, who said that the committee had issued an illustrated circular showing every part of a car-truck, including the various parts of the wheel, axle, and oil-box, each part being numbered; and then had sent a copy thereof to every master car-builder in the United States and Canada, with an accompanying printed blank, likewise numbered, with the request that every master car-builder insert opposite each number the name or names used on his road, for the piece designated by the same number in the engraving, requesting that the same be filled out and returned to the Secretary as early as possible. Mr. Adams stated that the committee found they had taken a big job on their hands; the matter was of vast importance, and they had been unable to complete it, although they had held many meetings. They had therefore made no attempt to complete it for presentation at this session, and could only report progress. The more they looked at it the more important it seemed. They did not wish to present it in an unfinished state. It was a work of years to perfect it, but they had finally succeeded in maturing a plan to bring it to a practical result. They had issued circulars to superintendents to enlist them in the service, and the RAILROAD GAZETTE had kindly placed at their disposal a large number of cuts of the different trucks, parts of trucks, and car-bodies, which would have cost to engrave specially for the work in hand thousands of dollars; and the committee had decided to issue circulars from time to time through the RAILROAD GAZETTE, and publish the replies thereto in the same valuable journal. The *National Car-Builder* had also placed its columns at their disposal, and would publish questions, and answers, and discussions thereon.

The immense importance of this dictionary, when perfected, could hardly be estimated. Large connecting roads, whose cars were constantly interchanging and being carried thousands of miles from where they were built, often remaining away for months, saw its necessity; though perhaps to smaller roads, whose cars did not leave their own lines, in was not so apparent.

The committee proposed to publish these circulars, and after receiving replies, to meet from time to time and decide upon the most appropriate term to be used to designate that particular thing, and then put under the name so chosen *all* the names used on all the roads throughout the United States, to describe the same article, so that a car-master receiving a telegram to furnish some distant shop with a certain part of a car, which had broken or required to be replaced, could turn to the dictionary, and, without loss of time, see exactly what was wanted. Mr. Adams stated, as an example of the trouble and inconvenience of the present absence of system, that he had recently received a dispatch from a car-master to send him an oil-box cover, and he would not have known what was meant had he not had a previous conversation on the subject with the car-master, as the name used bore no relation in his mind to the thing asked for; and there were sometimes fifteen or twenty different names used to designate the same thing, as, for instance, "oil-box," "case," "housing," "pedestal;" and in the case of "buffer," "bunter," "bumper," "bull-nose," "draw-bar," etc.

Mr. Garey, from the same committee, said if the Convention would think for just five minutes of the great importance of this dictionary of terms, not only to master car-builders, but to superintendents and others, they would devote the next two hours to the subject, and think it time well spent. The committee had provided circulars, which were lying on the table, and he wished every master car-builder in attendance would take one home with him and fill it out and return it promptly to the committee. If this dictionary is once brought to completion, its value alone would warrant all the expense and time expended in holding this Convention. On motion of Mr. Garey, the report was accepted, and the committee continued, with instructions to go on with the work.

The President stated that the Chairman of the Committee on Ventilation, Mr. M. P. Ford, was absent, and that his report would probably be sent in before the close of the session.

OIL-BOXES AND JOURNAL-BEARINGS.

The committee on these subjects, consisting of Messrs. J. B. Somerby, E. Varney and A. Gleason, made a report to the effect, that for the past twenty years they have used the Lightner box, and know of nothing better. Mr. Somerby's experience with brass bearings did not impress him favorably. He had tried them under Pullman cars, and they heated so badly they had to be taken out and Babbitt metal substituted. He had also tried brasses under oil cars, and they spoiled the journals. Messrs. Varney and Gleason had not used brass bearings.

Mr. Garey said, that judging from the report, the committee had only given their own individual experience. He hoped all present would express their opinions on the subject. He had used solid composition bearings on the New York & Harlem road almost exclusively for eighteen years, the material being tin and copper, and could not from his own experience recommend Babbitt for general use. He was running 50 feet drawing-room cars on journals 3¼ by 5½, very successfully with solid bearings.

Mr. Varney stated that his road had used composition or Babbitt metal. It was composed of tin, copper and antimony, and worked well. He made a shell of brass and filled it with Babbitt.

Mr. Kirby stated that nothing connected with cars was more important to railroad managers than the question of brasses or car-bearings. "Brasses" was an indefinite term for car-bearings or journal-bearings. He had used several kinds on the road with which he was connected. Had used a composition of ten parts of lead and one of antimony, called Babbitt metal, in a brass shell, but found after a time, that the composition was worn out and the journal was running on the shell. Had given up the use of a filled bearing and now used solid ones. A composition of seven parts copper and one of tin had been used. If bearings are made right, there is no trouble, but he was opposed to Babbitt metal as it is generally used. Would like to hear expressions of opinion on this subjects, as he considered it a very important one.

Mr. Davis said there were two kinds of bearings in use, the lined and solid. As to Babbitt metal, very few saw it at the present time. It was impossible to get it unless the roads make it themselves. The original Babbitt was composed of a small part of antimony and a large proportion of tin. Genuine Babbit would wear well.

Mr. Steinbach said that on his road they had about 108,000 journal-bearings in use. They rated all cars as 4-wheel cars; had used a cast-iron skeleton and filled it with a composition of copper, tin, and antimony; made their own bearings; some were four inches in length, and all the way up to eight inches; thought a medium preferable; when the composition wore down, the skeleton was refilled.

Mr. Adams asked, if in case it wore down to the cast iron, it would affect the journal; and if so, how would it affect it?

Mr. Steinbach replied that it would probably injure the journal if it wore down to the iron.

Mr. Adams asked if Mr. Steinbach would recommend that kind of bearing for connecting roads. He (Mr. A.) had understood that, owing to the nature of the traffic, the cars on the road represented by Mr. S. could not be used on other roads. That gentleman's road was a very important one, and his experience in connection with it was valuable; but he (Mr. Adams) was compelled to differ with him, as he had never seen cast-iron journal-bearings work well, and he had seen many kinds in his experience on the Boston & Albany and Lake Shore & Michigan Southern roads, with which he had been connected. He used a filled bearing, and preferred them made of a composition shell of about seven parts copper and one part tin, with a strip of same running lengthwise the bearing to strengthen it. This should be filled with good Babbitt. The strengthening bar should be from ¼ to 1 inch wide. Roads would save in the long run by the use of good metal filling, and should not buy the cheapest, if poor in quality. It isn't the first cost that tells in the long run. The best is the cheapest. If solid brasses are used, they should be well cared for. If on failure to lubricate they get hot, they will braze to the journal and sometimes twist it off. He had prevented hot boxes on his road by care in oiling, and the use of a good metal shell, and a good but soft composition filling. This does not wear any longer, but required less care and gave better results. There is no difficulty if a good quality of composition is used to start with, and is kept properly oiled.

There were a number of composition bearings in the market. Some worked well, some did not. Had used one called "star-metal," and had very good and very bad luck with it. Two very heavy passenger cars had run with it for two years, 200 miles a day, at the rate of 30 miles an hour, without having a hot box; but he had never had the same success again. He believed in a good metal properly filled. Preferred the old "Timm" form of bearing, as it equalized the weight better. Lightner's improved box might do the same, but he wouldnot be in favor of his old box.

Mr. Varney stated that Babbitt metal, as originally made, was composed of nine parts tin, one part copper and one part antimony.

Mr. Holmes said a composition of six to seven parts copper and one of tin would stand longer. Some use five parts copper, but from six to seven undoubtedly make the best metal. It was of the utmost importance that the ingredients should be *new* metal. If scrap about the shop were melted for the purpose, iron would get mixed with it, and cut the journal.

Mr. Davis said there were cars on his road twenty-five years old, having iron-cased bearings. When he found them, he broke the iron and used the Babbitt to melt up.

At this point of the discussion a motion was made to lay the report of the committee on the table, which was agreed to.

WHEELS AND AXLES.

The committee on this subject, consisting of Messrs. C. A. Smith, V. D. Perry and I. W. Van Houten, reported verbally with a view to elicit discussion, and referred to a drawing in possession of Mr. Garey; whereupon

Mr. Garey submitted a drawing of an axle which he had adopted in 1860, since which time, he said, he had often heard of broken axles on other roads, but none on his own road. Ninety-nine out of a hundred broke immediately adjoining and inside of the wheel, and his experience went to show that the shoulder on the axle at that point was the cause of breakage. The axle represented by the drawing had no shoulder whatever, and none of this kind had broken on the road. The diameter was increased inside the wheel $\frac{1}{16}$ or $\frac{1}{8}$ of an inch to prevent the wheel from getting loose. He used a 25-ton pressure in putting on the wheel. The axle was 5 inches diameter at the wheel, and 3¾ inches in the center.

Mr. Varney said the standard axle on his road was 4¼ inches at fit, and 3¼ in the center, and very nearly the same pattern as Mr. Garey's. He used a tapered shoulder ¼ of an inch in size, to stop the wheel from shoving on, if it should by any means get loose.

Mr. Kirby thought Mr. Garey's principle correct. The axle should be smaller in the center, to permit of vibration.

Mr. Varney thought the axle should be so made that the vibration would not be centred, but be distributed throughout the axle.

Mr. Griffith had used a shoulder on axles next the wheel, and had five axles break: but since he had discarded the shoulder none had broken.

Mr. Garey said that in 1858 he used to have broken axles, and in thinking the matter over had made up his mind something was wrong. He put a number in the lathe and turned them down. Nearly all were cracked at the shoulder. He failed to find one cracked at any other point.

Several members expressed themselves favorably toward Mr. Garey's form of axle.

Mr. Steinbach did not like a shoulder, but turned his axles in the shape of a groove at that point.

Mr. Adams said he had never seen an axle break outside of the wheel, except where abrasion of the bearing on the journal caused it to twist off. He thought one reason why axles broke was that the size of them had not been increased the last twenty-five years, while the weight of cars and the loads they carried had been very materially increased.

No problem in operating railroads was more vexatious or more difficult to solve than that of hot boxes. The use of a uniform box and axle on all through lines would tend very greatly to abate the evil; but we load too heavily for the amount of iron there. If we could adopt a standard on all new work, the old cars would wear out and be gone in ten or twelve years. The sooner we commenced, the sooner it would be done.

Mr. Garey said that years ago, on the New York & Harlem street-cars, 8 by 2 inch bearings had been used, and the axles broke. One only broke in the centre; all the others on the outside of the wheel. He changed to 5½ by 2¼ journals and used the tapered axle as shown in the drawing, and not a single axle had broken in horse-cars since. Used no shoulder. The shoulder had an undoubted tendency to destroy the axle.

Mr. Varney said axles on the Fitchburg road had been in use for twenty-five years, and none had broken. They had shoulders ¼ of an inch, and the axles were 3¼ thick in the centre. He thought the spring of the axle had preserved it. Ten years ago, he had adopted a longer and thicker journal.

The Chairman said passengers were roused out of their berths at midnight because sleeping-cars had to be switched off on account of hot boxes and broken and defective axles. Hoped some plan would be discovered to do away with the evil.

Mr. Steinbach said he used 8-inch journals, and they did well.

Mr. Adams said his road now used steel-tire wheels in passenger equipment. It was too soon to give results, but he thought 150,000 to 200,000 miles would be their average life. Some which had run 60,000 to 70,000 miles showed no signs of wear; 50,000 was a good mileage for an ordinary chilled wheel; 60,000 was a large mileage; but a wheel running 50,000 miles was an extra good wheel, and that amount of service was all we could expect from it.

Mr. Jones indorsed what had been said about Mr. Garey's axle.

Mr. Davis said he did not believe in lengthening the journal unless the thickness was also increased. He recommended journals 5½ inches long and 3¼ inches thick. He used 5½ by 3, and had no broken axles, but the iron was of the best quality. Passenger-car axles were not allowed to run more than a year. They were then put under freight cars, in which service they did not break.

Mr. Ramsey then offered the following resolution, which was agreed to:

Resolved, That it is the opinion of this Convention that the shoulder hitherto used upon car-wheel axles for the purpose of staying the wheel at a certain place be abandoned, as it is a detriment, and no benefit.

Mr. Adams said that a uniform standard axle ought to be agreed upon, especially for roads whose cars were sent thousands of miles away, as it would save thousands of dollars to railroad companies and shippers of freight, and avoid the inconvenience of making repairs whenever a break-down occurred.

On motion, the further discussion of the subject was postponed until the next day.

SUNDRY REPORTS.

The Committee on Brakes, consisting of Messrs. R. S. Ramsey, Joseph Jones, and Hugh Gray, announced that they deemed it inexpedient to make any report until after the trial of the steam brake which was to be made on Friday by the St. Louis & Iron Mountain Railroad.

The Committee on Links and Pins had no formal report ready.

Mr. Davis suggested that passenger trains generally had too much slack between the cars, and would recommend a uniform length of coupling and less slack, especially where the air-brake was used.

Mr. Nickerson, of the RAILROAD GAZETTE, presented a report on Narrow-Gauge Cars, which was received and ordered to be placed on file.

The Committee on Light Weight Freight Cars had no report to make with reference to a resolution adopted at the last annual meeting at the suggestion of Mr. C. A. Smith, recommending that each master car-builder construct a box freight car of twelve tons capacity, and as light and strong as a durable car can be built.

SCALE OF PRICES FOR DAMAGED CARS.

Mr. Ramsey moved that a committee of three be appointed upon the question of cars damaged on foreign roads, and that said committee report a scale of prices to apply in such cases.

The motion was seconded, and a discussion ensued, in which Messrs. Ramsey, Steinbach, Adams, and others participated, as to the basis upon which the damage could be determined. It was difficult to fix the value of a car of a given age. If ten years be assumed as the average life of a freight-car, it was manifest that a car seven or eight years old would depreciate more during the last two or three years of its life, and would not be worth one tenth of its first cost for each year remaining after a certain amount of service had been performed by it.

Mr. Leighton thought the adoption of a standard for castings and axles would obviate the difficulty of making repairs, and the matter of settling damages would therefore be easier of adjustment.

Mr. Ramsey's motion was amended so as to increase the committee to five, in which form the motion was carried.

The President appointed as such committee, Messrs. J. L. Hackathorn, John Kirby, D. Hoit, R. S. Ramsey, and F. D. Adams.

Adjourned to nine o'clock the following morning.

SECOND DAY'S PROCEEDINGS.

The Convention met on Thursday morning at nine o'clock, and was called to order by the Chair. The reading of the minutes of the previous day's proceedings was dispensed with.

PLACE OF THE NEXT ANNUAL MEETING.

Mr. Adams moved that when the Convention adjourns, it adjourn to meet in the city of New York. A discussion followed, indicating, as the general sense of the Convention, that a different place of meeting should be selected every year. The motion of Mr. Adams was amended by substituting the city of Boston in place of New York, in which form the motion was carried.

On motion of Mr. Adams, it was resolved that a committee of three be appointed to make arrangements for the next annual meeting. The chair appointed as such committee, Messrs. W. E. Chamberlain, A. Gleason, and Osgood Bradley, Jr.

DEAD WEIGHT.

Mr. Adams referred to the light freight cars which were to be constructed the last year with a view to ascertain whether the dead weight could be profitably or safely lessened, and said he believed none had been constructed. He desired to learn the views of members on the subject.

Mr. Varney said the box cars on his road weigh from 8 to 8½ tons, and he found that many cars on other roads weighed more. He wouldn't want to build light cars to be run in trains with heavy cars, as the light ones would get the worst of it. They would stand no chance in a train with heavy ones.

Mr. Adams said that narrow-gauge cars, weighing some 4,500 lbs., were understood to carry as much as an ordinary car of the usual gauge. He took that statement, however, with a grain of allowance. He did not see how he could lighten the car below the present weight without weakening it. He agreed with Mr. Varney that, as a general rule, if cars were made

lighter, they would be stove up when running in heavy trains. His opinion was, that we were now building cars as light as they could be built with safety.

Mr. Gray said he could not see where he could reduce the weight of his freight cars. They weighed nine tons, and were none too strong for the heavy loads they carried.

Mr. McGee said he had given the matter considerable study to see if he could reduce weights any, but was satisfied he could not, if the cars were to do the work intended when they were built. He could build cars of lighter material, but would not be justified in doing so, if they were to be loaded as they are at present.

Mr. Davis said that lighter cars than those now in use were built twenty-five years ago, and some of them were still running; but he found that when they run with heavier cars they got down. He now built heavier cars, and would be glad when all the light ones were gone.

Mr. Steinbach said this question had been argued a number of years, and he believed we must build cars as heavy as we were now doing for heavy work; but if lighter work was intended, they could be built lighter. His box-cars weighed nine tons. He believed in heavy cars.

Further discussion on this subject was then postponed.

OIL-BOXES AND JOURNAL-BEARINGS.

The report of the committee upon these subjects was again taken up.

Mr. Kirby moved to appoint a committee with instructions to issue circulars asking questions, and from the answers thereto compile a report and present it at the next meeting.

Mr. Adams said it was desirable to draw out an expression from members *now* as to the possibility of establishing a uniform axle and oil-box.

Mr. More said he hoped there would be further discussion as to uniformity in axles, oil-boxes and journal-bearings for the 4ft. 8½in. gauge. All knew the difficulty of making a change. It can't be done in a year; but it is desirable to make a commencement on new work.

Mr. Garey said he was opposed to any definite or final action on the subject at this time. He thought all the facts bearing upon it should be collected by the committee, by means of circulars, and then maturely considered in committee. In that way, a valuable report could be presented next year. We can not afford to make a mistake in so important a matter. It might not be so hard to accomplish a uniformity as some supposed. The majority of all axles now made were 6ft. 9in. long, with journals 5½ by 3¼ in.

Mr. Davis said the circulars heretofore sent out by committees had not been answered so generally as was hoped. He thought the least that members could do was to answer the questions thus asked.

Mr. Kirby said the committees should do the work during the year, and all the members should help them. Then thorough reports could be made during the interim, and thus the time of the Convention would not be wasted.

The President said he would like to hear the views of members upon the size of axles, as an indication of the size which would most likely be adopted or recognized as a uniform standard, when final action in regard to it should be taken.

Mr. Adams thought a standard should be adopted as soon as possible, so that all new work could conform to it.

Mr. Gray thought that we should not make axles any smaller. He was using axles which suited the requirements of his road. He did not think if a 5½-in journal were adopted as a standard, he could conform to it.

Mr. Leighton thought the committee should also ask for the sizes of wheel-fit, etc., with breakages of axles, and the sizes of such broken axles, so that the best size, and the one showing least breakage, could be adopted. The car company with which he was connected had received during the last two years more orders for journals 6 inches long, and 3¼ diameter, than for any other size. For new roads which had not specified the size, they had during the last two years used no axles with journals less than 6 inches. These were in passenger cars.

Mr. More thought that axles used years ago were too light; but the roads had increased them, and most roads were now satisfied their axles were heavy enough. Many roads had from two to five lengths of axles; also journals varying from 4½ to 7½ inches in length. He thought some size should be adopted, so that a car at San Francisco or any other place could have a new axle put in without delay.

Mr. Garey thought that uniformity was quite as important in other things. The axle was only one thing. In cars running so far there should be a uniformity as to size and shape of oil-boxes, bearings, etc., so that no new patterns might be required in making repairs.

Mr. Holmes said there were more than a dozen different sizes of journals on his road, and more than twenty different brasses, pedestals and oil-boxes. Had adopted journals 3¼ by 6in. for new work. Had used Babbitt brass, Hopkins brass and solid brass. Where journals were oiled properly, the Hopkins brass did best; but he was now using solid brass as a general thing, and it worked well. Hoped the committee would be appointed, and report at the next meeting, and we should be prepared to agree or not agree with the report.

Mr. Adams said the circulars should be issued as soon as possible, and moved to amend the pending motion for the appointment of a committee, so that instead of waiting until next year for the report, it should be prepared and published in the RAILROAD GAZETTE and *The National Car-Builder* at least three months before the next annual meeting, which amendment was accepted by Mr. Kirby. The original motion, as amended, was then agreed to.

The chair appointed Messrs. John Kirby, F. D. Adams and D. Hoit as such committee on car-axles, oil-boxes, journal-bearings and center-plates.

INTERCHANGE OF CARS.

The committee on this subject, consisting of Messrs. Hackathorn, Adams, Ramsey, Kirby and Hoit, submitted the following report:

Any railroad company receiving the cars of other companies for the purpose of running them over its road, or otherwise using them, will be required to return the same in as good general condition as they were in when received; or if this be not done, the necessary cost of restoring them to such condition will be charged to the company so receiving, running or using them. In order to prevent, when cars are returned, any question as to the condition they were in when they left the company's line to which they belonged, notice should be given by the company receiving them at the time they are received of any particular thing that may be deemed as constituting a lack of fair condition. Any repairs made to through cars while in the use or possession of any company must be at the expense of that company; and no claims for repairs to through cars will be allowed. An exception will be made, however, as to wheels and axles, which, if broken by fair usage, all companies shall pay for new wheels or axles, less the value of the ones broken.

1st. All parties contributing cars shall keep such cars in as perfect order as possible.

2d. All other repairs required, through fault of a company when the cars are being hauled over its road, are to be made by and done at the expense of such company; and cars shall be closely watched and inspected at the terminus of each road or division; and when repairs are needed, they shall be permanently and thoroughly made.

3d. Each road is to deliver the cars to connecting road in good running order.

4th. Whenever any company repairs such cars, of whatever brand or kind, such repairs shall be made in a permanent manner, and after the style adopted by the road contributing the cars; and when castings or other parts are made, to replace those broken or lost, they are to be made same as the originals. If forgings and buffers, or other parts are made, they shall be of the style and pattern of the original in the cars.

5th. In order to give good dispatch to movement of cars, it shall be the first duty of the car inspectors, as soon as the car arrives at a terminal station of any road, to see that it is in good running order and ready to deliver, and in case the delivering and receiving inspectors disagree as to the condition of the car, the case is to be immediately referred to the superintendents or their representatives.

6th. Each company is to treat such cars of other roads, when on its road, in reference to repairs, oiling and packing-boxes, in the same manner as its own are treated.

7th. In case a car under load, in transit, has defects that do not render it unsafe to proceed on its journey before being repaired, the inspectors may make a note of such defect, and such car will be received back in same condition, and may be receipted for in bad order; but all such cars shall be returned, without load, to the road on which the damage was done, for repairs.

8th. In case cars are destroyed on any other line than that to which they belong, it shall be the duty of the car-master of such road to immediately notify the car-master of the road owning such car of the date of its demolition, giving the number and style of such car or cars, and trucks, whether of wood or iron.

9th. In settling for cars destroyed on any line other than that to which they belong, the cost of the car shall be taken, less the value of iron as scrap, and deduct ten per cent. per year from that amount, and the balance shall be considered the value of the car destroyed. In case the demolition does not extend to the trucks, the trucks may be returned at a proper valuation. Respectfully submitted, and signed by the committee.

DISCUSSION ON REPORT ON INTERCHANGE OF CARS.

Mr. Adams said the report was drawn up by gentlemen of large experience in the practical working of the system of interchange of cars, and who knew the exact results of the suggestions it contained.

Remarks were made by Messrs. Wadlia, Kirby, Hackathorn, and others, conceding that if a wheel or axle should break, the road upon which the break occurred could replace the same, and charge the actual cost thereof to the road owning the car, less the value of the old axle and wheel, as scrap.

Mr. Wadlia thought the report should say something about the length of time cars were kept in shop repairing. Cars had been known to be gone from home a year and a half.

The report was then adopted, and the committee discharged.

On motion it was resolved that the Secretary of the Association be instructed to send a circular to superintendents of railroads, together with a copy of the report just adopted, requesting the adoption of the same by their respective companies.

COMMITTEES AND CIRCULARS.

The President then appointed the following committees, who are to issue circulars asking information upon the several topics named, and whose duty it shall be to report a summary or compilation of such information to the next annual meeting of this Association:

On Heating, Ventilating and Lighting Passenger Cars.—Messrs. W. E. Chamberlain, V. D. Perry and A. Gleason.

On Car Roofs.—Messrs. Ambrose Ward, C. A. Smith and George Hackett.

On Truck and Car-Body Check-Chains.—Messrs. C. C. Millar, W. J. Coles and J. M. King.

ELECTION OF OFFICERS.

The Committee on the nomination of Officers of the Association to serve during the ensuing year, made a report recommending the reappointment of the present incumbents, namely:

M. C. Andrews, *President.*
M. P. Ford, *Vice-President.*
Leander Garey, *Secretary.*
A. Steinbach, *Treasurer.*

The recommendation of the committee was concurred in, and the gentlemen named were unanimously elected to serve during the current year.

Mr. M. N. Forney, of the RAILROAD GAZETTE, and Mr. Horatio Brooks, of the Brooks Locomotive Works, were unanimously elected associate members of the Association.

SUNDRY REPORTS.

The Committee on Finance made a report fixing the assessment upon each member of the Association to defray expenses of the current year at five dollars, which was agreed to, and the committee discharged.

The Committeee on Models and Drawings made a report calling attention to sundry models and drawings, which had been presented to the Convention, embracing numerous devices and improvements, for which the Convention make due acknowledgment to the donors.

The Committee on Circulars submitted a series of questions to be embodied in the circulars to be sent to members by the Secretary. No formal action was taken thereon, and the reporter deems it unnecessary to recapitulate them.

The Committee on Communications presented letters from the following master car-builders, regretting their inability to be present: Benjamin Welch, Central Pacific Railroad; W. A. Morgan, Virgania & Tennessee Railroad; W. H. Price, Evansville, Henderson & Nashville Railroad; I. W. Van Houten, Pennsylvania Railroad. Also a communication from A. W. Soper, Superintendent of the St. Louis & Iron Mountain Railroad, stating that he was authorized by the President, Hon. Thomas Allen, to invite the members of the Convention to visit Pilot Knob on a special train.

The communications were received and placed on file.

THANKS.

On motion, the following resolution was unanimously adopted:

Resolved, That the thanks of the Master Car-Builders' Association be tendered to W. W. Wagner, Esq., President of the New York Central Sleeping-Car Company, for the use of the new and elegant drawing-room coach, "City of Toledo," which he courteously placed at the disposal of the Eastern delegates to this Convention; also to the officers of the New York Central & Hudson River, Lake Shore & Michigan Southern, Toledo, Wabash & Western, and the Chicago, Alton & St. Louis railroad companies, for their kindness in passing said car over their respective roads; also, to all other roads which have conferred their favors on the delegates attending this Convention; also, to the merchants and manufacturers of St. Louis, who organized the pleasant programme for our entertainment; also, to Hon. Thomas Allen, President, and A. W. Soper, Superintendent of the St. Louis & Iron Mountain Railroad, for their liberal tender of a special train to convey us to Pilot Knob and Iron Mountain; also to the proprietors of the Southern Hotel for the satisfactory accommodations afforded by them to this Convention; also, to the press of St. Louis, for their courtesies and attentions; and to the RAILROAD GAZETTE and the *National Car-Builder*, for their efforts to advance the interests of this Association.

DECEASED MEMBERS.

The following preamble and resolutions were unanimously adopted:

Whereas, God, in his inscrutable providence, has taken from among us during the past year, and since our last meeting, our respected friends and brothers, William Waddington, of the Pittsburgh, Fort Wayne & Chicago Railroad, and C. D. Mills, of the New York Central & Hudson River Railroad; therefore

Resolved, That we, as members of the Master Car-Builders' Association, do hereby tender our sympathy to the afflicted families of the deceased, in the sad bereavement sustained by them in the deaths of our efficient and beloved brothers, in the earnest hope of a happy reunion in the world to come.

Resolved, That our Secretary be requested to send a copy of these resolutions to the families of our deceased brothers.

The committee on a subject of a monument to the memory of Mr. J. R. Chiles, late of the Chesapeake & Ohio Railroad, reported progress. Report received, and committee discharged.

A discussion took place in regard to the expediency of appropriating $100 as a prize for the best drawing to be presented at the next meeting. Subject laid on the table.

On motion, the Convention then adjourned to meet at Boston, Mass., on the second Wednesday in June, 1873.

Report of the Erie Railway Company.

At the election of directors, July 9, the following report for the seven months from October 1, 1871, to April 30, 1872, was submitted by the retiring President, General John A. Dix:

Heretofore the reports of the managers of this company have embraced the operations for the previous fiscal year ending September 30; but a special law having been passed by the last Legislature of this State, ordering a new election to be held on the second Tuesday of July, instead of the second Tuesday of October, as provided by former laws, the directors in surrendering their trust can only give a *resume* of the history of the operations of the road for a period of nine months, extending from September 30, 1871, to July 1, 1872, and even for this the last two months are partially estimated, the accounts having been settled and closed to the 1st of May only; and it may be proper to remark that whatever credit or discredit may appear from the statements must attach, not to the present managers, but to their predecessors in office.

The earnings of the company from all sources from October 1, 1871, to May 1, 1872 (seven months), were as follows:

From Freights	$8,142,849 00	Operating expenses Erie Railway	$7,093,971 12
From Passengers	1,664,005 44	Interest on Mortgage Debt	1,289,447 25
From Storage	1,020 53	Rents of Railroads, etc.	594,360 55
From Telegraph	17,526 51	Taxes	166,808 84
From Rents	84,004 41	Hire of Cars, etc.	360,862 60
From Mails	102,515 69		
From Miscellaneous sources	67,585 26		
Earnings Erie Railway Co	$10,079,506 84	Expenses Erie Rail way Co	$9,485,451 36
Earnings from leased branches	295,092 66	Operating lea'd lines	316,530 57
			$9,801,980 93
Total earnings	$10,374,599 50	Surplus	572,618 57

The earnings from freight and passengers for the seven months compared with the corresponding period of previous year were as follows:

	1871.	1872.	Increase.
Passenge s	$1,585,766 51	$1,664,005 44	$78 238 93
Freight	6,819,573 65	8,142,849 00	1,323,275 35

The number of tons of freight in each of the above periods were:

	1871.	1872	Increase.
Through, East	530,341	583,135	52,794
Through, West	117,132	151,136	34,004
Way, East	1,248,538	1,833,397	584,859
Way, West	394 397	561,723	167,326
Total in tons	2,290,408	3,129,391	838 983

The number of miles run by freight trains, with earnings and expenses per mile run, are as follows:

	Miles run.	Tons moved.	Earnings.	Earnings per mile run.
1871	3.835,403	2,290,408	$6,819,573	$1 78
1872	4,768,973	3,129,391	8,142,849	1 71
	Earnings per ton moved.	**Expenses**	**Average cost per ton moved.**	**Average cost per mile run.**
1871	$2 98	$5,404,650	$2 36	$1 41
1872	2 60	5,285,008	1 69	1 11

CAPITAL AND DEBT.

The capital stock and debt of the company on the 1st of July were as follows:

Stock.

Common stock	$73,000,000	
Preferred stock	8,536,010	
		$86,536,010

Funded Debt.

First mortgage, payable in 1867	$3,000,000	
Second mortgage, payable in 1879	4,000,000	
Third mortgage, payable in 1883	6,000,000	
Fourth mortgage, payable in 1889	4,441,000	
Fifth mortgage, payable in 1888	926,500	
Buffalo Branch, payable in 1891	182,600	
Sterling bonds, £1,000,000 1875	say 4,844,400	
Consolidated mortgage, 1920, issued	6,446,000	
Scrip dividend	199,640	
		30,040,140
Total stock and funded debt		$116,576,150

Floating Debt.

Including loans on demand, bills payable, outstanding vouchers and payrolls and accrued interest on funded debt	$6,463,668

The loans on demand and time are covered by collateral securities owned by the company.

Bonds of other railways of undertakings guaranteed by the Erie Railway Company, all bearing seven per cent. interest:

1. Paterson & Newark Railroad, interest on by endorsement on bonds, of which this company owns $250,000.	$500,000
2. Newburgh & New York Railroad, interest on by endorsement on bonds of which this company owns $166,000.	250,000
3. Buffalo, Bradford & Pittsburgh Railroad, interest on by endorsement on bonds of which this company owns $185,000.	594,000
4. Suspension Bridge & Erie Junction Railroad, interest on bonds	1,000,000
Interest on stock by endorsement on shares.	500,000
5. Pavonia Horse Railroad, interest on which this company has ceased to pay, and may, perhaps, be released therefrom.	100,000
6. New York & Boston Express, interest on All held by this company, the express company being extinct or about being closed up.	170,000
7. Boston, Hartford & Erie Railroad, interest on The question as to the company's liability on the guarantee of these bonds is now before the courts. On $1,900,000 of these bonds this company is under special agreement, in addition to the original endorsement on bonds, to pay the interest.	5,600,000

8. Narragansett Steamship Company, interest on..... 1,000,000
by endorsement on bonds. The company has not been called upon to make any payments on account of this guarantee, nor is it likely that they will be.
9. Newark & Hudson Railroad (not yet completed) interest on..... 250,000
by endorsement on bonds. No interest has yet been paid by the company, but they may be called upon to do so.
10. Union & Titusville Railroad Company, interest on.. 500,000
The company has not yet been called upon to make any payments on account of this guarantee.

RENTALS.

The Paterson & Hudson River, Paterson & Ramapo, and Union railroads, extending from Jersey City to Suffern, 32 miles, $78.400.

The Weehawken Branch—rental based partly upon a percentage per ton per mile, which amounts to say $30,000 per annum.

The Paterson & Newark Railroad	$35 000
The Newburg & New York Railroad	17,500
The Montgomery & Erie Railroad	25,000
The Goshen & Deckertown Railroad	21,500
The Hawley Branch & Jefferson Extension	56,000
The Carbondale Branch	140,000
The Chemung Railroad (gold)	30,000
The Buffalo, New York & Erie Railroad	233,109
The Erie & Genesee Valley Railroad (gold)	8,400
The Avon, Genesee & Mount Morris	15,000
The Buffalo, Bradford & Pittsburgh Railroad	26,530
The Suspension Bridge & Erie Junction Railroad	105,000
The Rochester & Genesee Valley Railroad	32,100
The Cincinnati, Hamilton & Dayton Railroad	180,000
The Weehawken property	83,200
The Long Dock property, interest and taxes	240,000
General offices, taxes and insurance	75,000

Nearly all of the above leased roads are valuable adjuncts to the company's road, and some of them are indispensably necessary to its successful working. The 32 miles of leased roads in New Jersey form the eastern end, and the Buffalo, New York & Erie Railroad the western end of the main line from New York to Buffalo. By the Hawley and Carbondale branches the large and profitable anthracite coal tonnage is obtained, and by the Suspension Bridge road Niagara Falls is reached and a connection made with the Canada roads.

All of the above are broad-gauge or six feet track.

The railroad of the Barclay Coal Company, with its furniture and equipment, is leased for twenty years by the Towanda Coal Company, which is operated by the Erie, this company paying for the same an annual rental of $30,000 and a royalty of twenty-five cents per ton for the coal. This arrangement is an advantageous one for the company, securing as it does a supply of coal at cheap rates for the use of the locomotives.

The broad-gauge track of the Cincinnati, Hamilton & Dayton Railroad Company was leased perpetually by this company at a yearly rental of $180,000, but this arrangement, like many others of a similar character made by the late management, entails an unnecessary and improper loss to this company, and it can probably be terminated, the same not being valid as against this company.

The lines owned, leased and operated by this company are as follows:

	Miles.
Main line, extending from Jersey City to Dunkirk	459
Included in this distance are the leased roads—Paterson & Hudson River, Paterson & Ramapo, and Union railroads—thirty-two miles in length	
The Weehawken Branch & Fort Lee Railroad, to the cattle yard on the Hudson River, leased	5
The Northern Railroad of New Jersey—From Jersey City to Piermont; operated by this company at 65 per cent. of the gross earnings	26
The Hackensack & New York Railroad—To Hackensack	7½
And the Hackensack Extension	13½
Both operated at 65 per cent. of gross earnings.	
The Paterson & Newark Railroad, extending between these places, leased	11¼
The Piermont Branch—Owned by this company	15
The Newburg & New York Railroad—From Turners to Vail's Gate, leased	13¾
The Newburg Branch—Chester to Newburg; owned by this company	18¾
The Montgomery & Erie — From Montgomery to Goshen, leased	10½
The Goshen & Deckertown—Goshen to Pine Island, leased	12
The Hawley Branch—Lackawaxen to Hawley, leased	16
The Jefferson Railroad—Hawley to Honesdale, leased	9
The Carbondale Branch—Carbondale to Susquehanna, leased	36½
The Chemung Railroad—Elmira to Watkins, leased	17½
The Buffalo, New York & Erie Railroad—Corning to Buffalo, leased	141½
The Rochester & Genesee Valley Railroad—Rochester to Avon, leased	18½
The Erie & Genesee Valley Railroad—Dansville to Mount Morris, leased	14¾
The Avon, Genesee & Mount Morris—Avon to Mount Morris, leased	15¼
The Buffalo Branch—Hornellsville to Attica, owned by this company	60
The Buffalo, Bradford & Pittsburgh Railroad—Carrollton to Alton, leased	25½
The Suspension Bridge and Erie Junction Railroad—Buffalo Junction to Niagara, leased	23¼

These roads, although operated in most cases without profit, are justified by the fact that they bring profitable business to the main line.

RECAPITULATION.

	Miles.
Length of road, main line	459
Length of branches owned	96¾
Length of roads leased	368¾
Length of roads operated at 65 per cent. of gross receipts	46¾
Total	971¼
Second track on same and side tracks	476
All broad gauge or 6 feet track	1,447¼
On 64½ miles, Waverly to Watkins, and from Buffalo to Suspension Bridge, a third rail, forming narrow gauge, is laid, equivalent to single track	32¼

Train service is furnished at from 75 to 90 cents per mile, run on following roads:

	Miles.
Warwick Valley, broad gauge	10
Walkill Valley, " "	18
Monticello & Port Jervis Branch, broad gauge	24
Barclay Branch, narrow gauge	16
	68
Total	1,547½

LOCOMOTIVES.

The number of locomotives owned by this company is 489, of which number 95 are passenger, 342 freight and 52 are switching engines. Of the freight engines 20 are condemned and are being reconstructed. 17 locomotives have been added to the equipment since September 30, 1871.

CARS.

The number of cars is as follows:

First-class passenger cars	208
Second-class and emigrant cars	44
Baggage and express cars	73
Milk cars	26
Box freight cars	3,170
Box stock cars	565
Slat stock cars	88
Slat oil cars	321
Oil tank cars	442
Flat cars	2,116
Coal cars (eight-wheel)	1,569
Coal cars (four-wheel)	1,570
Cabooses	204
Derrick and tool cars	27
Total number of cars owned by the company	10,423
Cars leased of the Barclay Railroad (four-wheel cars)	338
Cars hired of the Erie & Atlantic Sleeping Car Company (first-class passenger)	33
Cars hired of the Union Car Co. (box freight)	500
Cars hired of the Jefferson Car Co. (four-wheel coal)	1,500
Total	12,793

Since September 30, 1871, the following cars have been added to the equipment, viz.: 12 first-class passenger cars, 350 box freight, 545 flat, 487 coal and 16 cabooses.

CAR CONTRACTS.

The contracts between this company and the Sleeping Coach Company provides that the latter shall furnish sleeping and drawing-room coaches complete, with the furniture and fixtures properly adapted to their use, and necessary attendants, and shall receive for their use four cents for each mile run, and the additional amount paid by passengers occupying the same over and above the rates of fare charged on the regular passenger coaches of the railway company.

The Union Car Company furnish 500 box freight cars suitable for transportation of grain in bulk at one cent per car per mile run, the railway company to keep the same in repair and guarantee a minimum monthly service of 2,500 miles per car. The Jefferson Car Company furnishes the railway company with 1,500 four-wheel "dump" or coal cars at half a cent a car per mile for carrying coal, the railway company to keep the same in repair, and guarantee a minimum monthly service of 1,400 miles per car.

TABULAR STATEMENTS.

Tabular statements, giving in detail the items of earnings and expenses for seven months, also details of construction, liabilities and assets of the company, and also a statement of earnings and expenses for nine months ending July 1, are hereto appended. This last table, although estimated in part, may be regarded as substantially correct, and exhibits a gratifying result in the largely increased earnings and diminished expenses of the road.

Although something has been done in the way of reform, and measures are in progress which, if carried out, will do much more toward placing the affairs of the company on a firmer basis, yet the existence of many contracts which involve loss to the company is a subject of regret; some of these, in all probability, can be abrogated, and others modified so as not to be so onerous in their requirements.

But it is in the matter of additional facilities for increasing business, securing remunerative rates and economical operations, that the company must more particularly look to secure satisfactory returns on their investment.

The double tracking of portions of the road, the introduction of the third rail to secure narrow gauge connections, and steel rails in place of iron for renewals, stand prominently among the needed requirements. The report of the Vice-President, recently submitted to the Board, gives details and estimates of the expenses of this work, a copy of which report is hereto annexed.

Elaborate tables accompany the report, giving in detail the sources of the receipts, the earnings of the leased lines, the distribution of expenditures, and the following table of the earnings and expenses for the nine months past, in which the figures for May and June are partly estimated:

	Earnings.	Expenses Interest, Rents, &c.	Profit.	Loss.
October	$1,698,645	$1,329,630	$369,015	—
November	1,482,459	1,318,253	164,206	—
December	1,417,311	1,387,525	29,686	—
January, 1872	1,332,994	1,365,891	—	$32,897
February	1,294,076	1,355,628	—	61,552
March	1,460,173	1,399,742	60,430	—
April	1,548,812	1,505,083	43,728	—
May (estimated)	1,739,211	1,425,000	304,211	—
June (estimated)	1,463,963	1,400,000	63,963	—
Total	$13,42,7547	$12,486,752	$940,792	—

Increase of earnings of 1872	$1,681,302
Decrease of expenses in 1872	394,822
Total	$2,076,125

From the first half of the current calendar year the earnings were $8,829,231; expenses, $8,451,346; net earnings. $377,885. Taking from these the dividend of 3½ per cent. on the preferred stock, there remains a surplus of $79,092.

Appended is a report from Gen. A. S. Diven, the Vice President, who is an engineer, giving estimates for various important improvements—the completion of the double track, the laying of a third rail to accommodate trains of the standard gauge, the reduction of excessive grades, the substitution of iron for wooden bridges, the completion of necessary depots, new machine shops and grain elevators, and the purchase of sufficient rolling stock for the standard gauge. For a third rail on both tracks, and the sidings between Jersey City and Buffalo the estimate is $5,551,800 for steel rails, and $4,890,150 for iron. For a third rail from Hornellsville (needed only when the Atlantic & Great Western shall have changed its gauge), $1,161,000 for steel and $1,025,700 for iron. For a third rail from Salamanca to Dunkirk, $332,150 for steel and $294,200 for iron.

For completing second track on Delaware Division with iron bridges, $2,297,225 with steel and $2,201,015 with iron. For completing second track on Susquehanna Division, $654,025 with steel and $602,050 with iron. For completing double track from Hornellsville to Salamanca (Western Division), $1,837,914 with steel and $1,702,614 with iron. For completing second track from Hornellsville to Buffalo (Buffalo Division), $1,998,540 with steel and $1,824,300 with iron. These improvements will cost in the aggregate $13,832,654 with steel and $12,540,029 with iron rails.

For additional buildings, $1,149,000. For additional equipment, $5,700,000. These carry up the estimates for needed improvements to $20,681,654 with steel rails and $19,389,029 with iron. The double track on the Delaware Division he considers indispensable to any increase of business, and its completion on the Susquehanna Division as of next importance. With these improvements the company would have two tracks complete between Jersey City and Buffalo.

—At Cordova, Buenos Ayres, where the people are very religious, a railroad was constructed. The people viewed it with curiosity until a locomotive was put on, when they decided it to be an invention of the devil, if not the devil himself, and every train was received with showers of stones, and at last they began to tear up the road.

ELECTIONS AND APPOINTMENTS.

—On the opening of the Baltimore & Potomac, the Alexandria & Washington, and the Alexandria & Fredericksburg railroads on the 2d of July, Mr. J. N. Dubarry, Vice-President of the Northern Central Railway Company, took charge of them as Vice-President and General Manager, and announced the following appointments: E. L. Dubarry, Superintendent, and Joseph Crawford, Resident Engineer of the three roads, and J. S. Leib, Treasurer; Stephen Little, Auditor; Ed. S. Young, General Passenger Agent; J. M. Drill, General Freight Agent, and C. M. Lewis, Master of Machinery (all of whom hold the same positions on the Northern Central), of the Baltimore & Potomac and Alexandria & Fredericksburg roads. Messrs. E. L. Dubarry and Joseph Crawford have their offices in Washington, D. C., the others in Baltimore; O. A. Stevens, formerly General Superintendent of the Washington & Alexandria Railroad, assumes the title of General Agent.

—S. M. Mitchell, of Hartford has been elected Treasurer of the Hartford & New Haven Railroad Company, to fill the vacancy caused by the death of Captain Conner.

—The following is the list of officers of the Memphis & Charleston Railroad, under its sale to the Southern Railway Security Company: Joseph Jaques, General Manager; William J. Rose, Superintendent of the Western Division; C. Williams, Superintendent of the Eastern Division; Harry R. Ryan, Master of Transportation; A. A. Barnes, General Freight and Ticket Agent; S. L. Anderson, Auditor. Mr. Jaques is the Vice-President of the East Tennessee, Virginia & Georgia Railroad, also leased to the Security Company; Mr. Ryan was Assistant Superintendent before the lease, and Messrs. Williams and Barnes occupied the same positions before the lease.

—William G. Peck, Superintendent of the New Jersey Southern Railroad, has resigned his position, and G. W. Bentley, the General Manager, assumes charge of the operations of the road for the present.

—The following gentlemen were elected members of the American Society of Civil Engineers at the adjourned meeting, held July 10: Robert Cartwright, C. E., Cleveland, Ohio; Oliver E. Cushing, C. E., Lowell, Mass.; Joseph P. Dodge, C. E., Winona, Minn.; S. S. Greeley, C. E., Chicago, Ill.; Julius E. Hilgarde, C. E., Washington, D. C.; Max Hjortsberg, C. E., Chicago, Ill.; Charles F. Johnson, Jr., M. E., Owego, N. Y.; Charles C. Martin, C. E., Brooklyn, N. Y.; Edward D. Mason, C. E., St. Joseph, Mo.; E. M. Reed, C. E., Hartford, Conn.; C. C. Smith, C. E., Fond du Lac, Wis.; Leon Soulerin, C. E., Chicago, Ill.; Henry Tyson, C. E., Baltimore, Md.; Dan J. Whittemore, C. E., Milwaukee, Wis.; Gen. W. W Wright, C. E., Leavenworth, Kan.; John McLeod, C. E., Louisville, Ky.; I. C. Buckhout, C. E., New York city; Joseph Whitney, C. E., Cambridge, Mass.; G. W. R. Bayley, C. E., New Orleans, La.

—At the annual election for directors held in the office of the Lafayette, Muncie & Bloomington Railroad Company, July 2, the following were elected directors: Joseph S. Buckles, J. W. Burson, John Parker, Muncie, Ind.; John Green, David Kemp, Tipton, Ind.; A. B. Givin, Frankfort, Ind.; H. S. Mayo, J. B. Rugar, J. B. Falby, John Connolly, Sr., Adams Earl, John Purdue, Robert Heath, Lafayette, Ind. The board organized by the election of Adams Earl, President; John Green, Vice-President; H. S. Mayo, Treasurer; E. M. Talbot, Secretary and Chief Engineer.

—June 22, on application of the Trustees of the Internal Improvement Fund of Florida, Judge Wheaton appointed J. C. Greeley Receiver of the Florida Central Railroad, a section of the Jacksonville, Pensacola & Mobile road. This is the fifth appointment of a receiver for the line, Greeley having been appointed for the Jacksonville, Pensacola & Mobile and for the Florida Central, J. M. Baker for the same (two appointments), and F. B. Papy for the former.

TRAFFIC AND EARNINGS.

—The receipts of the Marietta & Cincinnati Railroad for the month of June were: 1872, $154,589; 1871, $115,115; increase, $39,472, or 34¼ per cent. For the six months ending with June the receipts were: 1872, $904,932; 1871, $750,786; increase, $154,146.

—The receipts of the Burlington, Cedar Rapids & Minnesota Railroad for the third week of June were $22,938.

—The earnings of the St. Louis, Kansas City & Northern Railway for the month of June were: 1872, $296,820; 1871, $211,581; increase, $85,239, or 40¼ per cent.

—The earnings of the Great Western Railway of Canada, for the week ending June 14, were: 1872, £21,215; 1871, £16,889; increase, £4,326, or 25⅝ per cent.

—The earnings of the Grand Trunk Railway, for the week ending June 15, were: 1872, £35,200; 1871, £30,700; increase, £4,500, or 14⅔ per cent.

—The earnings of the Erie Railway, for the week ending June 30, were: 1872, $340,739; 1871, $345,806; decrease, $5,067, or 1½ per cent.

—The earnings of the Erie Railway, for the month of June, were: 1872, $1,463,963; 1871, $1,498,493; decrease $34,530, or 2⅓ per cent.

—The receipts of the Kansas Pacific Railroad for the month of June, were: 1872, $315,362.66; 1871, $266,085.85; increase, $49,276.81, or 18½ per cent. For the fourth week of June the receipts were: freight, $55,835.50; passenger, $25,588.20; total, $81,423.70. Of this $9,610.05 was from government traffic.

—One of the workmen on the Brooklyn tower of the East River bridge fell from the top into the inside well, a distance of 102 feet, into three feet of water, without being seriously injured, and was able immediately after to adjust a rope round his body, by which he was raised to the top.

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Editorial Announcements.

Address.—The RAILROAD GAZETTE *will be printed for the present in New York; our printing house in Chicago having been destroyed. All communications, therefore, whether editorial or business, should be directed to the New York office. The proprietor will receive subscriptions and advertisements at his office in Chicago, Nos. 63 and 65 South Canal street, but letters should be addressed to New York.*

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

BOILER CONSTRUCTION.

In the GAZETTE of last week we published the report of the committee appointed by the Master Mechanics' Association to consider the subject of "Boilers and Boiler Material." It is, we think, quite within the bounds of truth to say that this report was more able and interesting, and attracted more attention, than any other which has ever been read before the Association. At first sight, it is difficult for many readers to realize the interest which attaches to this subject, and it is hard for most of us so to exercise our imaginations and memories so as to recall vividly those ghastly and horrible impressions which either the sight or the description of boiler explosions has from time to time produced on us and the whole community. Recall as vividly as we may the frightful pain and anguish, the helpless suffering, the shrieks and the groans and the mutilation of the wounded and dying, the succeeding hours of agony, the blighted future, desolated homes, the sorrow and dumb despair—conceive of it all as we may, the reality is tenfold more terrible and painful. With this picture in our minds, it is hard to imagine more culpable or heartless carelessness than is implied by total indifference to this subject on the part of those on whose shoulders the care of steam boilers and responsibility for such catastrophes rest, or, what is worse, allowing private or selfish interests to stand between them and a clear statement and conviction of the truth. Knowing how wretchedly defective is the construction and how stupidly ignorant is the design of many steam boilers, it was with no ordinary satisfaction that we heard and have since read the report and discussion on boilers and boiler material at the Master Mechanics' Convention. It is quite plain that the subject has thus been brought clearly to the consideration of those who are, or should be, most interested in the subject. It is also true that nothing remarkable in the way of discovery was presented, either in the report or discussion; but well known facts were brought home to those who otherwise could hardly be induced to think of them. Take for example the experiments of the Committee on punched and drilled plates. Similar experiments have been tried and reported from the other side of the water, but it would be utterly impossible by any statement or presentation of them to give the facts so much force as they have when the man who made the experiments gets up and bears testimony to what he has done. It is quite true that the accuracy of these experiments and the deductions therefrom have been questioned, and it is said that the mere testing of the resistance of two pieces of iron, 1¾in. wide by $\frac{A}{16}$in. thick, united together with a single rivet, is not a sufficiently comprehensive experiment to justify any safe conclusions with reference to the strength of drilled and riveted seams. With this view we sympathise, but allowing it all the force which is due to it, the experiments, nevertheless, *indicate* in the strongest way possible that a boiler plate is over 30 per cent. stronger through the line of holes, if the latter are drilled instead of being punched. With this testimony before us, how can any one consent to make boilers with punched plates, unless he has some perfectly reliable experiments with which he can show that those recorded by the Committee are fallacious or unreliable. The report indicates in the strongest possible way that a boiler is made 30 per cent. stronger at the weakest point if the plates are drilled than it is if they are punched. Is this testimony to be disregarded, or will further evidence be sought? The former plan would be criminal, and the latter the only rational one to pursue. For purely humanitarian considerations, it is painfully evident that some accurate and carefully conducted experiments are needed.

Those who dissent most from the conclusions of the report, while they admit that with badly constructed punches iron or steel will be much injured by punching, yet say that if the punch and die are properly proportioned no such injury will result. It is of course possible that this may be true, but it needs to be shown just what is the proportion which they should bear to each other. At present it is safe to say that nine-tenths of those persons who have the charge of such work are quite ignorant of the proper construction of dies and punches. Assuming, however, that it is possible to make punches so that the iron will not be injured by their use, there is nevertheless the danger and risk which must always attend their use so long as those who use them are careless or ignorant. No such risk attends the use of a drill, so that this danger at least is to a great extent eliminated.

Before dismissing this subject, we wish to call attention to a fact in the report which the Committee did not elaborate. We refer to the strength *per square inch* of metal of the iron before being either drilled or punched, as compared with that of the pieces which were tested after the holes were made in them.

The strength was as follows:

Pieces without holes	59,752 lbs. per square inch
Pieces with drilled holes	50,270 lbs. " "
Pieces with punched holes	38,419 lbs. " "

It will thus be seen that a certain amount of deterioration results from the operation of drilling as well as punching. Probably different qualities of metal would be affected to a greater or lesser degree by one or both of the operations. Accurate information is needed with reference to this as well as other points.

In the staying of boilers the report of the Committee reveals some very grave defects. That a boiler with *forty* broken stay-bolts should continue to carry a full pressure of steam, is either marvellous or providential. The quiet assertion that another had *fifteen* broken does not increase one's feeling of security when in the vicinity of a locomotive under steam. That careful and skillful investigation into the present system of bracing the inside of locomotive boilers would reveal sources of weakness now unsuspected, seems quite probable. In fact, any one with considerable knowledge of the strength of materials, will, on a simple examination of ordinary boilers, discover sources of weakness which could easily be remedied. It is a very common practice to find bars of iron 1¼ inches in diameter dependent entirely upon either the direct or shearing strength of two ⅝ inch rivets for their only attachment to the head or shell of the boiler. It does not require much knowledge of mathematics to calculate that the rivets have less than half the strength of the brace.

The recommendation of the Committee to use hollow stay bolts, seems to be worthy of immediate and universal adoption. Any manufacturer who will make and supply bolts of this kind of the very best material will be almost sure to secure an immediate and large demand for them. The tubes which are now manufactured, it is said, are deficient in strength and homogeneity, and the process of drilling a small hole through solid metal is necessarily slow, tedious and expensive.

On the use of steel for fire-boxes and boilers, there was much difference of opinion, and probably only a dozen or more years of experience in making and using that material will reconcile the present conflicting opinions or reveal clearly the causes and reasons for the defects which are now reported.

Concerning the combustion of coal, neither the Committee nor those who took part in the discussion had any new suggestions to make. Generally the opinion seems to be gaining ground that none of the devices for smoke combustion pay. There is, of course, considerable difference of opinion regarding this matter, but generally those who have tried the different devices proposed have abandoned them, and come back to the plain fire-box. Of course such testimony as that of Mr. Towne should not be disregarded, but there are so many considerations which effect such experiments that it is difficult, without all the facts before us, to draw any intelligent conclusions. That as much depends upon the fireman as on the fire-box, there can be little doubt; and whether the economy attributed to the latter may not in great part be due to the former, it is hard to determine merely from the report of experiments. In this connection it might not be amiss for the Association to consider whether there is not some room for the improvement of that department of railroad service, and whether some contract system might not be adopted which would give the locomotive runner and fireman some of the results of their skill. Various systems of rewards and conditional compensation have from time to time been adopted, but none that we know of has met the case exactly. That those plans which have been tried have failed is only additional reason for the exercise of greater skill and forethought in devising a system devoid of the difficulties which have appeared in those which have been adopted.

All who took part in the discussion of this subject seemed to agree in thinking that the economy of coal burning depended to a very great extent upon the size of the boiler—in other words, the larger the boiler the more economically could coal be used. That there is no limit to the size of boilers which can be economically used excepting the weight of the engine, experience fully shows. The statement of Mr. Towne, that the locomotives with 48-inch boilers ran from 42 to 48 miles to a ton of coal, while those with 35-inch boilers ran only from 32 to 38, hardly seemed to have as much weight given it as its importance demands. If this fact was once established, and its importance fully realized, the Committee would then be called upon to direct their inquiries so as to determine how the dimensions and efficiency of locomotive boilers could be increased without increasing their weight or diminishing their strength. If the efficiency of a boiler is dependent upon its size, and this is limited by its weight, then the next direction which the inquiry would logically take would be to determine how to enlarge the one without affecting the other. It would be well, we think, for the Committee during the present year to give some attention to this branch of the subject.

The New Erie Directory.

At the election of the Erie Railway Company, in New York, last Tuesday, the following were chosen directors by the unanimous vote of the shares voted, the number of which was 418,696, a little less than one-half of the entire number issued: Samuel D. Babcock, Samuel L. M. Barlow, John J. Cisco, Charles Day, John A. Dix, W. Butler Duncan, John T. Johnston, J. Talbot Olyphant, Edwin D. Morgan, Frederick Schuchardt, William R. Travers, New York; Alexander S. Diven, Elmira, N. Y.; Henry L. Lansing, Buffalo, N. Y.; William W. Shippen, New Jersey; John V. L. Pruyn, Albany N. Y.; Homer Ramsdell, Newburg, N. Y.; Peter H. Watson, Ashtabula, O.

Of these Messrs. Barlow, Cisco, Day, Dix, Travers, Diven, Lansing, Pruyn and Ramsdell were re-elected, most of them having entered the board at the time of the resignation of the Gould board, though Cisco and Pruyn have been chosen later to fill vacancies, the latter succeeding the late George C. Hall, we believe. The retiring members are Messrs. W. W. Cryder, Gilson Homan and Edward H. Green, American citizens long resident in London, who, it was thought, might be declared ineligible for non-residence, according to the laws of New York; General George B. McClellan, W. W. Sherman, F. N. Drake, H. G. Stebbins, and Edwin Eldridge. Mr. Homer Ramsdell is the only member of the new board who was in the directory with Gould and Fisk. No attention seems to have been paid to the law prohibiting the election of directors of the Atlantic & Great Western road, or else Messrs. Barlow and Duncan must have retired from that board, of which retirement we have seen no report. Of the new members, Messrs. Babcock, Duncan and Schuchardt are bankers, the two last closely connected with Bischoffsheim & Goldschmidt, of London, we believe. Mr. Duncan takes the place of Mr. W. W. Sherman, a member of his firm. Mr. John Taylor Johnston is President of the Central Railroad Company of New Jersey, and has distinguished himself in that position. Mr. G. Talbot Olyphant is President of the Delaware & Hudson Canal Company, which operates some

hundreds of miles of railroad, some of which, like the Albany & Susquehanna, can be worked in connection with the Erie quite conveniently. Mr. John V. L. Pruyn was formerly Treasurer of the New York Central Railroad. Mr. E. D. Morgan has been Governor of New York, United States Senator, and was once President of the Hudson River Railroad Company. Mr. W. W. Shippen was a director of the Camden & Amboy Railroad before the recent consolidation. Mr. Peter H. Watson was for a time Assistant Secretary of War under Lincoln's administration, is a director and Secretary of the Jamestown & Franklin Railroad Company of Pennsylvania, but is best known to the world as President of the late lamented South Improvement Company, which so narrowly escaped securing a monopoly of the petroleum traffic last spring, in which capacity he endeared himself to the inhabitants of the oil regions. Besides, the Atlantic & Great Western is represented by its Secretary, Mr. Charles Day, as well as by Messrs. Barlow and Duncan, who are, if they have not resigned very recently, in its directory.

Nearly all the members are well known, and have an excellent reputation for integrity and ability. Several have had wide experience in railroad management.

It has been counted as against them that they were chosen chiefly by those who are largely interested in the Atlantic & Great Western; but in a free election, such as this was, after so long a discussion of the merits of the two properties and the advantage or disadvantage of their union, no one has a right to complain. The shareholders—such as cared to vote—have made a deliberate choice, and the wisdom of their choice concerns themselves chiefly, the public very little. It was very different when the control of the road was seized, as it were, by parties to whom the shareholders has granted no authority.

We regard it as unfortunate that the law should exclude residents of England from the directory. We believe that when we ask foreigners to invest their money in our public works we should give the man an opportunity to participate directly in the management of the property they own. For the community it is most important that the railroads should be operated economically, and no one is likely to make so great an effort to secure their economical working as he whose income depends on their returns.

Association Reports.

Some of our contemporaries have been considerably exercised because the Civil Engineers' Society and the Master Mechanics' Association have not furnished them with copies of the papers and reports, which were read at their meetings, for publication. What seems to make this omission the more aggravating to them, is the fact that the RAILROAD GAZETTE has published very full reports of both these meetings, with some criticism and comment thereon. In order to do so we had a representative and a reporter at the Chicago meeting, and sent a representative to Boston to attend the convention of the Master Mechanics' Association. Our contemporaries were at perfect liberty to do the same thing, but it seems they lacked the enterprise, and now they find fault with the secretaries of the respective associations because they have not furnished them with copies of the papers and reports for publication. Those who are finding fault seem to have an entire misapprehension of their relation to these associations. They seem to regard the publication of the proceedings of their meetings as a right, forgetting that it is only by courtesy that any one excepting the members are admitted to the deliberations. One of these societies has heretofore not admitted any persons excepting members; and when a contemporary says that he "could have obtained the reports themselves in full without the special permission of the officers of the Master Mechanics' Association," he forgets that the members have a perfect right to exclude him and everybody else from their deliberations if they choose to do so. The Association, in fact, may have its proceedings published anywhere or nowhere, as they may determine. Its members saw proper to select the RAILROAD GAZETTE, no other technical journal having taken the pains (as none has since) to send a representative to attend the meetings; and they did it in consideration of an agreement to publish *in full* both reports and discussions, and supply each member with copies, which we have done.

The same journal, which was not represented at the recent convention of the Master Mechanics' Association, finds fault with Mr. Setchel, the Secretary of the Association, for not helping it to make a report by giving it copies of all committee reports—a hundred or two pages of foolscap probably. Even if Mr. Setchel had been inclined to serve as amanuensis for the journal in question, he would not at that time have been able to; the report and proceedings, by direction of the Association, being in other hands for official publication. We will suggest that the proper time to make a report is at the session of the convention, and the proper way to get copies of the committee reports is to ask permission to copy them (not ask the Secretary to copy them) at the session; and not to wait until, according to a resolution of the Association, the papers are in use for official publication. Otherwise publishers must expect to wait until the Association has its printed copies ready for distribution.

At all events, it is very unjust to find fault with the Secretary for obeying the directions of the Association, and the intimation that he should use the funds of the Association in a way not authorized by that body, implies a degree of moral obliquity which, it gives us much pleasure to say, is not a characteristic of that officer.

Erratum.

In Mr. Louis Nickerson's letter on the Master Car-Builders' Convention, which was published in the RAILROAD GAZETTE of June 29, he was made to say, in the paragraph beginning "A very useful resolution," in which there is a discussion on the effect of shoulders on car axles, "greater, therefore, must be the variance between the transverse strains at the summit of the neck and the same strain upon fibres in the main shaft, which are continuous with them; for these last are still less than the extreme strains upon the main shaft, *in proportion to* their distance from the center." The phrase italicised should have been "in inverse proportion to."

THE RAILROAD ARMY, according to the "Tables of Occupations" recently completed at the census office from the returns for 1870, consisted at the time of taking the census of 1,902 officers of railroad companies, 7,374 railroad clerks, and 154,427 railroad employes—a total, rank and file, of 163,303 souls. This, we need not say would form by itself a large army. Besides these, however, there were 75 officers, 767 clerks, and 8,554 employes of express companies—in all 9,396 men. As these are nearly all engaged in steam railroad transportation, we have a total of 172,699 men engaged directly in railroad service. The entire number of persons engaged in occupations for wages or profits in the United States was 12,505,923, so that the railrord men formed nearly one-seventieth of the entire working force of the country—exactly 1.48 per cent. Doubtless if we were to add the number of those engaged in manufacturing railroad supplies or otherwise indirectly in the service of railroads, the number would be very much greater.

At the time the census was taken, there was in the country probably about 55,000 miles of railroad, and the number of employes was therefore at the rate of very little more than three per mile—a suspiciously small number, as it seems to us, as statistics of roads, which, though with more than average traffic are very closely managed indeed, show six or more per mile.

Engaged in other branches of transportation were 88 officers and 5,103 employes of street railroad companies, 56,663 sailors, 7,338 persons employed on canals, and 7,975 on steamboats—a total of 77,167. Adding these to the number of railroad men, we have 249,866 persons directly engaged in the business of transportation—an even quarter of a million, we will call it. This is just about 2 per cent. of the total number pursuing occupations. It is noticeable that the number of draymen, hackmen and teamsters is nearly half as great, being 120,756.

The proportion of those reported as pursuing an occupation for gain for the entire country is just about one to three of the total population. As those engaged in transportation are chiefly adults and men, it is probable that they represent at least as great a proportion of the population. This would make them the bread-winners for three-quarters of a million of souls.

A YOUNG RASCAL, who, we are happy to know, is now in the penitentiary, has confessed that he turned a switch on the Albany & Susquehanna Railroad "in fun, to see the cars run off." The cars did run off, and the man enjoyed the joke of a locomotive broken up, though he doubtless was dissatisfied because no lives were lost and no bones broken. He is serving a term now for stealing iron, but as soon as his time is out the company will be able to have him tried for the greater crime, and it is to be hoped that he will be kept out of reach of switches until his relish for sport shall have been somewhat decreased by age.

THE OFFICIAL REPORT of the Master Mechanics' Association does not appear this week, a portion not having yet reached us.

NEW PUBLICATIONS.

Coyne & Co.'s Railway Officials' Annual.—Here is a volume in shape like a music book—one of the kind used at singing schools and most churches, like the old "Carmina Sacra," the "Shawm," and all that race—with handsome muslin binding, inclosing 232 pages of matter, every other page for about half of the book being devoted to advertising, that being the main object of the book. But to make advertising valuable, it must be accompanied by matter which men like to read, and the matter which covers about 150 pages of this book was selected as likely to be what railroad engineers, mechanics and officers are likely to value and desire to preserve. How successful the effort has been, we find it not easy to say. Nearly all of it has been copied or compiled from the RAILROAD GAZETTE, and so any reflections against it would be self-condemnation, while were we to lavish the enthusiastic approval we may be expected to feel for what we give to the world in these columns, doubtless some cynical persons might sneer at our modesty.

But we will at least give such a description of the contents of the book as will enable the reader to know what can be found in it. It begins with Mr. Fairlie's now famous paper, "The Gauge for the Railways of the Future," followed by "The Relative Cost of Wide and Narrow-Gauge Railroads," in which are combined several of the articles from our journal setting forth the fallacies of Mr. Fairlie and others. In this are engravings of Fairlie's narrow-gauge cars and American narrow-gauge cars, and diagrams of sections of excavation and embankment, with pretty elaborate estimates. The subject is continued by an article from *Engineering* advocating the narrow gauge, and this is followed by the reply given in the RAILROAD GAZETTE. So *Engineering's* article on light rolling stock is followed by ours in reply.

This series of articles, giving *both sides* of the narrow-gauge controversy, will doubtless be very interesting to a great many people, as the literature on the subject hitherto has been very much scattered or altogether one-sided, and if we are not mistaken a good many people will be glad to obtain the volume from the publishers for the sake of these articles. But the book contains much else: articles on Bursting Boilers, Boiler Seams, Coal Burning, Compressed Air Engines, Forms of Car Axles, Liquid Fuel, Locomotive Proportion, Maintenance of Permanent Way by Contract, Crystallization of Wrought Iron, Punched *vs.* Drilled Rivet Holes, Railway Axles, Rolling Stock Maintenance, Railroads and the State, Size of Locomotive Driving-wheel Centers, and the Weight of Rails.

The book is a handsome one, and will doubtless be valued by those who receive it; and if the fact that we have numerous applications for back numbers of the GAZETTE which contain some of the articles here copied indicates anything, there will be many to whom the book is not given who will like to buy it. J. H. Coyne & Co., of Chicago, are the publishers.

Train Accidents in June.

We continue our record of accidents, which this month is fearful, both for the number and the fatality of the casualties:

On the 2d, a working train sent out from Clinton, on the Iowa Division of the Chicago & Northwestern Railway, to replace bridges carried away by the great flood, fell through the track at a point between Norway and Fairfax, where the roadbed had been undermined and the rails and ties remained with scarcely any support. Two section men were somewhat hurt.

On the morning of the 2d, a sleeping-car on the Nashville & Northwestern Railroad was overturned by the breaking of an axle near Pegram station, nineteen miles from Nashville. Five passengers were in the car. One was killed and one had a thigh broken and was otherwise injured. The other passengers escaped with slight bruises.

Early in the morning of the 3d, seven cars of a freight train on the Illinois Central Railroad jumped the track at Kenwood, near the city limits of Chicago. One car was broken up, but no one was hurt. No cause for the derailment could be discovered.

On the 4th, the locomotive of the regular passenger train on the Jacksonville, Pensacola & Mobile Railroad, which left Jacksonville at 6:20 a. m., exploded its boiler at Sanderson, 40 miles west of Jacksonville, killing the fireman, who was oiling the engine, fatally scalding the engine-man, severely and perhaps fatally injuring a lady who was standing on the depot platform near by, and badly scalding two colored men who stood near. The engine was one of Rogers', had been on this road about 18 months, and was nearly new when bought. It had been inspected shortly before and pronounced in perfect order. The cause of the accident, if such it can be called, is made plain enough by the following paragraph from the Jacksonville *Union*:

"At the White House, ten miles from Jacksonville, the engineer found that a quantity of sand had accumulated in the pumps, which so interfered with their working that it was impossible to keep the boiler properly filled with water. The train, nevertheless, proceeded to Sanderson (40 miles from Jacksonville), where it arrived on time at 9:50 A. M. and stopped at the water tank. Having filled the engine tanks, the engineer opened the throttle-valve to back the train down to the platform, and, as the engine moved, the pumps threw cold water into the red-hot boiler and an explosion immediately followed. The force of the explosion was downwards, blowing out the fire-box, lifting up the engine, which was turned over twice and thrown into the well or tank. None of the cars were seriously injured."

On the morning of the 4th, the night express train on the Rochester Division of the Erie Railway was thrown from the track at Kanona Station. A person riding on the locomotive was instantly killed, and the engineer mortally injured. Several passengers were injured, but none severely. No cause of the derailment was reported.

On the forenoon of the 5th, a misplaced switch caused the engine of a coal train to run off the track and down an embankment, near Port Jervis, on the Erie Railway, carrying eight coal cars with it. The fireman was instantly killed, and two others were injured seriously.

On the 6th, four grain cars of a freight train on the Fox River Valley Branch of the Chicago, Burlington & Quincy Railroad ran off the track at Coal Creek, four miles south of Ottawa, Ill. The cars were badly broken up, and the road obstructed some hours, but no one was hurt. A report says: "The place where the trouble occurred was at the foot of a heavy grade, and it is said that the train got the start of the engineer and brakeman and was going at a high rate of speed when the cars ran off."

On the night of the 6th, while the St. Louis & St. Paul express was going south on the Quincy, Alton & St. Louis Railroad, the engine fell into a torrent of water where a culvert had been washed away by the flood. The engine man was slightly injured, but was able with the fireman to swim out. The same train had narrowly escaped falling into a stream where a bridge had been washed away a little further north, the same night,

and this bridge had been rebuilt only a few days, having been washed away before on the 2d.

On the night of the 6th, a freight train of 45 cars broke in two on the Hannibal & St. Joseph Railroad between Quincy and Palmyra. The rear part afterwards ran into the forward part with such force as to break several cars badly and cause the loss of nearly half of the draft irons. Some cattle were crippled, but no person was hurt.

On the night of the 6th, while an east-bound passenger train on the Toledo, Peoria & Warsaw Railway was moving about two miles an hour, near Bushnell, Ill., the great flood having made the track dangerous and the water being on a level with the rails, the engine suddenly fell on the right of the track in ten feet of water, the road-bed having been washed away. The engineman saved himself by swimming.

On the 7th, shortly before 10 p. m., while the engine "Storm" was engaged in switching cars near the Detroit depot on the Michigan Central Railroad, the engineman, on reaching the main track, saw a Grand Trunk passenger train coming in, and reversed his engine, hoping to make the side track in time to leave the way clear for it. He was too late, and the engines came together with a comparatively slight shock, which damaged them but little. When they struck the engineman and fireman of the "Storm" jumped off, or, as they claim, were shaken off, and in some unexplained way the throttle was left wide open. Consequently the engine started back, increasing in speed, pushed on four cars loaded with grain, drove them upon a locomotive standing on the track near the elevator, and backed this into a train of passenger cars partly made up, knocking one from its trucks and breaking the platforms of the others. After having been stopped by this obstruction, it commenced running *back*, the cars left the track, and finally the runaway engine was side-tracked and caught, having made ruins of four freight cars, scattered the grain in them on the track, knocked the smoke-stack and head-light from one engine, battered another a little as well as itself, injured two passenger cars, one baggage and one smoking car, and scattered kindling wood and scrap iron for some distance along the track. An employee of the Great Western Railroad who was sitting in one of the passenger cars was severely hurt, and a few others were bruised a little. The result indicates that locomotives should not be left to go alone, and that there is a time to stick to your engine as well as a time to jump.

About 9 o'clock on the evening of the 8th, as the mail train on the Atchison & Nebraska Railroad was crossing the bridge between Iowa Point and Highland, part of the bridge fell and let the engine through, burying Major Firth, Superintendent of the road, and Mr. Allen, his secretary, who were seated under the headlight on the engine. Allen was killed instantly and it was six hours before Firth could be extricated from the wreck, he being fastened between a piece of timber and the smoke-arch, and his body partially buried in the mud and water. He was brought to Atchison and one arm was amputated above the elbow, but he died in a few days. The bridge had been undermined by a recent flood, but had been repaired, and a heavy engine with twelve cars had passed over it only a few hours previously. Orders had been left for the bridge carpenters to be there and signal if they should think the bridge unsafe. On approaching, the train slowed, and was running only four or five miles an hour, when the bridge gave way as soon as the whole weight of the engine rested on it.

On the night of the 9th a west-bound freight train on the Chicago, Rock Island & Pacific Railroad ran into two cows near Malcolm, Iowa, ditching the cars, killing the cows, but injuring no person.

On the morning of the 9th, the night express train from New York, on the Boston & Albany Railroad, ran into a mass of broken stone which had fallen upon the track near Worcester. The locomotive and three cars ploughed through, when the train was brought up by the Westinghouse brake. The engine was badly damaged, but the only other evil result was the delay of the train for some hours.

On the morning of the 10th the Worcester local freight train on the Boston & Albany Railroad ran into a number of cars that had broken from a through freight going in the same direction. A brakeman who attempted to jump from his car was terribly crushed and perhaps mortally hurt, and the engineman had his arm broken in jumping from his engine.

On the 10th there was a collision between a freight and a passenger train on the Kalamazoo Division of the Lake Shore & Michigan Southern Railway north of Kalamazoo, by which one passenger was somewhat injured.

On the 10th, a passenger train of the Winona & St. Peter Railroad ran into the rear of a freight train while going down the steep grade above the junction of the branch to Mankato, Minn., breaking up several cars, and wrecking the engine badly, but hurting no one. An account of the circumstances given by a local paper is substantially as follows :

"A conductor had come down from St. Peter with the freight train as usual, and left it standing on the main track, while the locomotive ran down to Mankato, three miles, to bring up any freight cars that might be ready to go east from that point. The time card allows the freight 35 minutes at the junction, but as there was a little extra business at Mankato, the time was overrun, and along came the passenger train. It was behind time and was running pretty fast, when suddenly turning the sharp curve at the Junction it came upon the standing freight train. The engineman had not even time to call brakes, but reversed his engine, and then he and his fireman jumped for their lives while the locomotive went plowing into the caboose and flat cars, making a complete wreck of them and doing considerable damage to the engine. There was, evidently, carelessness all around. The freight train had no right to the track on the passenger's time, and should not have been left without a flag out to warn approaching trains. On the other hand, the rules on the time card require all trains to approach the Junction with great care, expecting to find a train on the main track. Both conductors and the engineer have been suspended to await an investigation."

On the 10th, a part of a freight train on the Lake Superior & Mississippi Railroad jumped the track near Rush City, Minn., and several cars were badly shattered.

On the night of the 10th, a north-bound freight train on the Illinois Central Railroad was thrown from the track between Cobden and Makanda. Seventeen cars left the track, and many of them were badly broken up. The cause is said to have been a broken rail. No one was hurt.

On the morning of the 11th, as a train on the St. Paul & Pacific Railroad, with an excursion party of more than a hundred, was rounding a curve at full speed near Howard Lake, Minn., it ran into a cow which suddenly jumped upon the track. The animal was thrown high in the air, but when it came down fell squarely on the track and brought up the engine standing. The shock was such that a baggage car and a passenger car left the track and rolled down the bank. One passenger was severely injured, three others badly bruised, and five or six slightly.

On the 11th, a portion of a freight train on the Lake Superior & Mississippi Railroad ran off the track and several cars were badly broken up.

On the 11th, several cars loaded with wheat broke through a bridge near Rocky Point, on the St. Paul & Sioux City Railroad.

On the 12th a freight train on the Northern Pacific Railroad ran off the track near Detroit Lake, and nine cars went into the ditch, a number of mules were killed, and freight was scattered, several cars being broken in pieces. No one was hurt.

At 4 o'clock on the morning of the 13th, as a passenger train with one baggage, one mail, one express, three sleeping, one first-class and one second-class passenger cars was running around a sharp curve along a steep bluff on the Central Pacific Railroad near Wadsworth, Nevada, the two rear cars (first and second-class passenger) were thrown from the track, dragged for some distance over the ties, the rear one striking against the rocks of the bluff, and finally broke from the train and fell down an embankment twelve feet high, landing up-side down. There were about 35 passengers in the car, and 18 of them were hurt, but only one seriously and most slightly. The passengers in the sleeping cars were not even awakened.

About 5 a. m. on the 13th, there was a collision at Vermont Crossing, Ill., between a north bound passenger train on the Chicago, Burlington & Quincy Railroad and a south bound freight train on the Rockford, Rock Island & St. Louis. The passenger engine struck the freight about six cars from the engine and turned nearly bottom upward, a car of flour landing on top of it. Several of the freight cars were wrecked and the passenger engine was badly damaged, but no lives were lost. The crossing is oblique, and an orchard prevented the enginemen from seeing each other's trains until too late. It is reported that there was no semaphore and no watchman there.

On the morning of the 13th, a train coming into Dubuque, on the Iowa Division of the Illinois Central Railroad, struck a switching engine which stood on a side track, but had not moved far enough to leave space for the train to pass. The switching engine was somewhat damaged, but very little other injury was done.

On the morning of the 13th, ten cars broke from the rear of a freight train on the Peoria & Rock Island Railroad, while switching at Kellar's station. The grade being very steep between Kellar's and Peoria these cars ran back the entire distance, increasing in speed until, when they reached Peoria, it is estimated that they were running 70 miles per hour. Near the round-house in Peoria the runaway cars struck a locomotive which was standing on the track and wrecked it and its tender, while seven of the ten cars were shattered. One man was with the runaway cars, and he was severely but not fatally hurt.

On the 14th, as a freight train was leaving the round-house of the Toledo, Peoria & Warsaw Railway at Peoria, and was rounding a curve, one of the cars, a new one, left the track and pulled six more after it, which rolled into the ditch. The cars were all new and stiff. The conductor sprained his knee in jumping from the top of one of the cars. Little damage was done to the cars.

On the night of the 15th, the locomotive of a west-bound express train on the Erie Railway exploded near Swayne's Station, four miles west of Hornellsville, N. Y., killing the fireman instantly, fatally wounding the engineman, and slightly injuring a passenger who was riding on the engine and also a lady passenger. No cause of the explosion is reported.

At 10:30 p. m. on the 15th, as a through fast freight train bound to Philadelphia was passing by the station at Rahway, on the New Jersey Railroad, eleven cars, beginning with the fifth from the engine, jumped the track. The engine was reversed and brakes put on, at least on the forward cars, and the rear of the train coming on at great speed forced the derailed cars forward into an immense pile of bricks and a new depot building, crushing them to atoms and scattering the wreck and the freight over a very small space, in one report described as scarcely more than 50 feet square. A brakeman and a man who was stealing a ride in an empty car were killed, and another man who was stealing a ride was severely injured. A letter in the New York *Times* gives the following explanation of the accident :

"From Rahway north to Linden the grade is very heavy. On Saturday night the fast freight, making but few stops, ran down this grade rapidly, and on reaching the main-line switch passed it without difficulty, but as the locomotive struck the next switch, which was a spring switch, the engineer thought he felt his engine jump the track, and immediately gave the signal to put on the brakes and reversed his engine. The locomotive, however, fell back on the track, as did also the four cars nearest, and immediately following, but the eleven cars, commencing with the fifth, jumped the track.

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"The frog of the switch was broken and torn up by the accident, and it was impossible to tell whether it had been originally misplaced or not."

On the 17th, at one o'clock in the morning, a misplaced switch threw the locomotive of a freight train from the track of the Lake Shore & Michigan Southern Railway, near East Buffalo, causing it to set fire to some cars, two of which, loaded with oil, and one with live hogs, were burned.

On the morning of the 17th, an express train west-bound on the Indianapolis, Cincinnati & Lafayette Railroad, and a special train east-bound with several car-loads of excursionists from the St. Louis Sængerfest came into collision near Elizabethtown, Ind., about twenty miles from Cincinnati. A passenger standing on the platform of the special train was killed, and there was inconsiderable damage to the engine and some cars.

On the morning of the 17th, a construction train consisting of one box car and two flat cars pushed by a locomotive was wrecked about six miles east of Paxton, Ill., on the new Lafayette, Bloomington & Mississippi Railway, killing or fatally injuring eight men and injuring 18. It is reported that the train was running at excessive speed and that the front car, which was new and light, jumped the track. The cars being off the track and in the way of the engine, the latter crushed through them.

On the evening of the 17th, a locomotive on the Kentucky Central Railroad was thrown from the track near Boyd's Station by running into a cow. The death of the cow and the delay of the train were the most serious consequences.

On the 17th, an excursion train on the Central Pacific Railroad was thrown from the track by a misplaced switch at Richmond Grove, near Sacramento, and twelve passengers were injured. The switch was to a side track used only during the vintage season, which had been set for the main track and locked for months. Some miscreant had unlocked it, set it for the switch, and locked it.

On the morning of the 18th, a construction train ran into a freight train on the Chicago & Michigan Lake Shore Railroad near Lincoln, Mich. No one was much hurt.

On the evening of the 19th, a train, consisting of express cars and emigrant cars, bound from New York to Philadelphia on the Pennsylvania Railroad, was wrecked at Metuchin depot by the breaking of a car-axle. One passenger was mortally hurt and another very severely; others were simply bruised slightly. Seven cars were wrecked and three or four rolled down the embankment. The track was so obstructed as to delay trains for some hours.

On the evening of the 20th there was a collision on the Great Western Railway of Canada, between a construction train bound west and a freight train bound east. One man was instantly killed, three mortally wounded, and five more or less hurt. The engines and several cars were badly damaged, and the cost is estimated at $30,000 or $40,000.

On the night of the 21st, a freight train on the St. Louis, Kansas City & Northern Railway ran upon some ties which had been placed upon the track between Narbonne and Hardin, about 50 miles west of Kansas City, by which six or seven cars were thrown off the track and badly broken up. It is supposed that the obstructions were placed there by a person whose cow had been killed by a train, for which the company refused to pay. Evidently it was not the cow that should have been killed.

On the 22d, about 1 o'clock in the morning, as a train on the Grand Trunk Railway, consisting of engine, tender, one express and baggage car, one second-class passenger car, one smoking and post-office car, two first-class passenger cars, and a Pullman sleeping car, in the order named, was running eastward over the Grand Trunk Railway, the engine left the track a mile east of Shannonville Station, about 125 miles east of Toronto, and plunged down the bank on its side, the tender swung around and passed it, the express and baggge car passed beyond the engine and lodged diagonally across the track, the second-class car lodged with one end on the track and the other over the engine, whose safety valve it knocked off, and the smoking and post-office car crushed the roof and the side next the engine of the second-class car, the first-class car following had its trucks broken and fell partly down the embankment, and the other cars remained on the track. The engineman was instantly killed by the shock, and the brakeman and two passengers had limbs broken. The escaping steam from the boiler rushed into the broken second-class car, which was crowded with about 70 passengers, with results like those which frequently follow the explosion of a steamboat boiler, no less than 65 of them having been severely scalded, of whom, by the report last received, 31 had died.

A description by a correspondent of the Toronto *Mail*, who seems to have observed carefully, gives the circumstances and the supposed cause of the disaster :

"The scene of the accident, as you have already been informed, was just a mile east of Shannonville, about eight miles east of Belleville, near the foot of a rather steep gradient which ends just in advance of the iron bridge over the Shannon River, about three hundred feet further eastward. There is an embankment here for several hundred yards, presenting the form of an inclined plane. At the point where the accident occurred this embankment is about six feet higher. The condition of the road is excellent. The rails are nearly new, having been laid last summer, and they are made continuous by the connection technically known as the "fish-joint." The ties are sound and the ballasting ample. Altogether, it is an exceptionally good section of the railway.

"The cause of the accident still remains inscrutable. The indications point to a fracture of one of the small wheels of the locomotive, though this explanation is not altogether satisfactory. The flange of the forward wheel on the right side is undoubtedly broken off, but it remains doubtful whether this of itself would have caused the engine to leave the track. Besides, it is known that the driver, Hibbert, "tapped" all the wheels himself at Belleville, and found them without flaws. Still, from the position of the locomotive, it is clear that the flange could not have been broken after it left the track, and as the axles remain intact, while the rails, although bent, are unbroken, and as there is an absence of any other defect, it is the most reasonable supposition that the broken flange led to the disaster. There are marks along the track which show that something was wrong for at least two hundred and fifty yards before the final crash."

* * * * *

"The locomotive lay on its left side in the ditch at the bottom of the embankment, a complete wreck. The lower half of the front part was buried out of sight in the earth, through which it tore a great gap in its descent, while most of the machinery was twisted out of all shape, immense bars of iron being bent and doubled as if they had been so much putty. It must have been with terrific force that the engine was hurled off the track. The tender was some twenty feet further ahead, bruised and battered like a piece of sheet-iron,

and entirely reversed as if it had been swung round by some gigantic arm after parting from the engine. Diagonally across the track, the forward end pointing to the northeast, lay the baggage car. It had passed the overthrown engine in safety, but came to a stop about thirty feet beyond. The express messenger and the baggage-man, the only persons in this car, got out uninjured. The forward end of the second-class car swerved more to the right or south side, the front end falling partly over the embankment. It was this swerving that caused such sad results; for, as the side of the car passed over the rear part of the engine, lying at right angles with the track, it forced off the top of the safety-valve, and, of course, gave immediate vent to the steam and hot water with which the boiler was charged. To add to the horror, the smoking car behind was propelled with such force as to shiver to atoms the roof of the second-class car, as well as the side next to the engine, thus exposing all in the car to the full volume of the rushing, hissing and deadly vapor. There was at least seventy people in the car—every seat was occupied, while some were standing and others lying on the floor. The floor of the car was inclined toward the engine, and not more than fifteen feet from the open valve; the roof and side were torn away, and nothing interposed to lessen the fatal rush of the steam upon the writhing bodies of these seventy helpless creatures. The smoking car was entirely filled with the splinters and debris of the second-class car, and how any of the five or six persons who were in it got out with his life is a mystery."

On the 22d, a freight train of the Old Colony Railroad ran off the track at Titicut, Mass., 30 miles south of Boston, and the conductor and one of the brakemen were badly injured.

At noon on the 22d there was a collision between a freight and a passenger train on the Pittsburgh & Connellsville Railroad about three-fourths of a mile north of Connellsville, Pa. The trains were running around a sharp curve and ran into each other nearly at full speed, the enginemen not being able to discern the danger until the trains were nearly together. On the passenger train one passenger was slightly wounded, and the mail agent fatally. The conductor and another person on the freight train were killed. The two engines were shattered, and nearly all the freight was wrecked.

An exchange says of this accident:

"The express was running 35 miles an hour; the freight train, with its camel-back engine, 20 miles. The curve around the point of rocks was so sharp that no time was given to whistle brakes or reverse the engines. The shock was tremendous, but, as usual, the strongly-built Baltimore & Ohio cars running at a high rate of speed escaped the destruction which fell on the weaker freight cars moving at a lower speed. The former never left the track, and only one passenger was hurt, and her injury was only a fracture of the jaw. Lockhart, the killed conductor of the freight train, either forgot the time of the express, or the siding on which he was to stand while the express passed by."

On the 24th, as an east-bound freight train on the Missouri, Kansas & Texas Railway was crossing the bridge over the Marmaton, just west of Fort Scott, Kan., a wheel broke, letting down a truck, which loosened the timbers of the bridge so that three cars fell through. A number of cattle were killed and three persons slightly injured.

On the night of the 29th, as an express train on the Rutland Division of the Vermont Central Railroad was passing over a short culvert near Vergennes, Vt., the culvert gave way. The locomotive passed over safely, but the baggage car and four passenger cars were wrecked. A brakeman was severely injured, but the passengers were only badly shaken up.

This record is beyond comparison the worst we have had yet had to make, the number of accidents being greatly in excess of those of any of the four preceding months, the number of deaths being nearly one-half greater than the *total* of those four months, and the number injured being exceeded only in February. The terrible disaster on the Grand Trunk caused one-half of all the deaths; but excluding it, there were more deaths than for the three months previous.

The aggregate number of accidents in June was 44, by which 63 persons were killed and 114 injured. The accidents may be classified as follows:

Derailment—		
Unassigned causes	9	
Cattle on track	3	
Broken rail	1	
Pushing new and rigid cars	2	
Malicious obstruction	1	
Broken flange	1	
	—	17
Road-bed washed away		3
Misplaced switch		3
Breaking through bridge or culvert		3
Broken axle		2
Broken wheel		1
Collisions—		
Sections of train broken in two		1
Rear collisions		2
Head collisions		6
Crossing collision		1
Undescribed		1
Stone fallen on track		1
Runaway locomotive		1
Boiler explosions		2
Total		44

It is seldom that any careful examination into the causes of an accident is reported, and hence this classification is often very general. Two of the cases of derailment (one of them causing many deaths) were of trains in which new cars, stiff on their trucks, were pushed by an engine; in which the truck of the car not adjusting itself readily to the track, and the car not being heavy enough to overcome much resistance tending to raise it, the car easily leaves the track, when of course the heavy engine is much more likely to crush the derailed car than would a car or train of cars following.

Breakages are credited with eight accidents, three of them being of bridges and culverts, two of axles, one of a wheel, one of a wheel flange and one of a rail. The broken wheel is reported to have caused the breaking of a bridge also. The broken flange is assigned as the cause of the Shannonville accident on the Grand Trunk. Perhaps in none of these cases is it absolutely certain whether the accident was caused by the breakage or the breakage by the accident.

The bridge and culvert accidents we believe in all cases followed floods, which indicates that the fault was in the foundations rather than in the superstructure.

We should add to the accidents from breakage, probably, three collisions in which cars which had broken from their trains either were run into by or ran into other trains.

Eighteen of the 44 accidents reported caused no loss of life or personal injury.

Derailments caused 44 deaths, 40 being by two accidents, 8 were due to collisions, two to the breaking of a bridge, two to broken axles, four to explosions, three to misplaced switches.

For the five months past our record stands as follows: February, 21 accidents, 18 killed and 128 injured; March, 27 accidents, 3 killed and 67 injured; April, 22 accidents, 13 killed and 32 injured; May, 27 accidents, 9 killed and 33 injured; June, 44 accidents, 63 killed and 114 injured.

General Railroad News.

CHICAGO RAILROAD NEWS.

Illinois Central.

This company will move, this week, its general offices into the old land building, No. 58 Michigan avenue. This building has been thoroughly repaired, and will afford good quarters for the officers until the great depot building shall be built. The company report a large passenger business northward. The business with St. Louis is also rapidly increasing.

Chicago, Rock Island & Pacific.

The Atchison Branch is to be opened about the 15th of this month.

Pittsburgh, Fort Wayne & Chicago.

This company is now sending out of this city immense passenger trains for Baltimore. On Sunday evening the eastern train consisted of ten cars, with five sleeping cars. A similar train also left on Monday night. The fare to Baltimore or to Washington and return is only $19.

Chicago, Danville & Vincennes.

This company have begun the construction of its round-house, car and machine shops at Danville, Illinois. The business on this road is rapidly increasing.

PERSONAL.

—J. M. Walker, President of the Chicago, Burlington & Quincy and the Leavenworth, Lawrence & Galveston railroad companies, departed for Europe from his home in Chicago, July 1, with his family. Mr. Walker will return about the 1st of September, leaving his wife and children in Germany, where they will remain a year and a half, or more.

—Mr. William Bliss, General Freight Agent of the Boston & Albany Railroad, sailed for Europe this week, with his wife, to remain until September.

—Joshua Nye has resigned the office of Purchasing Agent of the Maine Central Railroad to accept the position of general agent of an insurance company, at an annual salary of $5,000.

—In accepting the resignation of William R. Barr, General Passenger Agent of the Erie Railway, the Board of Directors passed the following resolution:

Resolved, That in accepting the resignation of Mr. Barr as General Passenger Agent of this Company, this board desires to express their regret at this termination of official relations which have so long and satisfactorily existed, and to tender to Mr. Barr their thanks for the able administration of the passenger business of the company while under his charge, and which under his management has increased to an extent almost unparalleled in the history of railway service in the United States.

Mr. Barr began his career as a railroad man on the Buffalo & Erie Railroad, and was afterwards General Agent in Buffalo of the South Shore Line, between Buffalo and Chicago, then owned by several distinct companies.

—Since the lease of the Missouri Pacific to the Atlantic & Pacific, Andrew Pierce, Jr., of St. Louis, President of the Atlantic & Pacific, will make his headquarters in New York.

—W. B. Hale, General Passenger and Ticket Agent of the Ohio & Mississippi Railroad, having resigned, F. Van Dusen is appointed General Passenger Agent, and R. T. Brydon General Ticket Agent.

OLD AND NEW ROADS.

Lamoille Valley Railroad.

This railroad is reported as progressing rapidly, and nearly extended to Wolcott, Vt.

Cumberland & Ohio.

Jefferson County, including Louisville, Ky., will vote, July 17, on a proposition to subscribe $1,500,000 to the Cumberland & Ohio Railroad Company for the construction of a road from Louisville *via* Taylorsville, Lebanon and Campbellsville, on the Burksville & Sparta line to Chattanooga. This line is southeast from Louisville as far as Taylorsville, about 35 miles, and thence nearly due south all the way to Chattanooga. It would be a direct competitor with the Louisville & Nashville road for through traffic, but not to any great extent for local traffic, being for the most part at a considerable distance from its line.

Mississippi Valley & Western.

At a recent election the voters of Keokuk refused by a poll of 33 to 621 to subscribe $10,000 to this company, in consideration of a wagon bridge over the Des Moines.

Kansas Central

This narrow-gauge railroad was opened as far west as Grasshopper Falls, 36 miles from Leavenworth, July 4. It is intended to have 20 miles more completed by the 1st of August.

Hoosac Tunnel.

The Schnectady *Star* of July 6 says:

"On Friday of last week, at ten minutes past ten o'clock a. m., the last brick of the twelve million which compose the arching of the western entrance to the Hoosac Tunnel was laid by State Engineer D. B. Frost, the first being laid just six years ago this month by Engineer Doane, the second by R. C. Campbell, and the third by Mr. John Hocking, who was the efficient superintendent of the Farren job, and afterwards a contractor with Wm. Holbrook, which firm completed this magnificent work. Thus the great obstacle which the former opponents of the Hoosac Tunnel clamored against as impossible to overcome, has with its quicksand, water, loose lime-rock and enemies been conquered."

St. Louis, Hannibal & Keokuk.

Articles of incorporation of this company have been filed with the Secretary of State of Missouri. The articles prescribe that the road shall pass through or near Troy, Lincoln County; Bowling Green, Pike County, New London, Ralls County, and Hannibal. The capital stock is to be $6,000,000.

Delaware County.

The Delaware County (Pa.) *American* says, that sufficient stock has been taken in this company to effect a legal organization. As soon as the necessary steps have been taken, work will begin at once.

Chester Valley.

The Philadelphia *Ledger* says:

"The Reading Railroad Company works the Chester Valley road, and pays to the latter the stipulated profits, which are applied, as far as they go, to the payment of the coupons of the company's bonds, now somewhat behind by reason of the income of the road being less than the annually maturing interest. No provision, we think, has been made for paying the principal of the bonds."

Portsmouth, Great Falls & Conway.

A branch of this road has recently been completed from the main line west to Wolfborough, N. H., seven miles. At Wolfborough a new steamboat connects with the train for points on Lake Winnipiseogee.

Philadelphia & Erie.

Concerning the destruction by flood of the new Linden Bridge, which had been so rapidly built to replace the one lately destroyed by fire, a correspondent writes from Williamsport, July 1, as follows:

"The trestle-work put up in four days and used for about ten days or two weeks was carried away on Tuesday night, June 25, about 6:45 p. m., and with it 21 loaded cars, by the late flood and logs in the river, the river having risen very fast to 15 feet above low-water mark. In hopes of saving the trestles, loaded cars were put on it to keep them down, but the logs coming in so thick, jammed against the trestles and pushed them out. One span of the trestle was moved soon after the cars were put on the bridge, but there being no engine there at the time, and as it started somewhat earlier than expected, it carried 21 cars out of 27, all but 4 of which were loaded with anthracite coal. The trestles will be again replaced as soon as the water falls, and trains will cross by July 4.

"The road on the opposite side of the river is being pushed forward as rapidly as possible, and trains can use this track while the bridge is being rebuilt. The branch is about six miles long, side hill road with some filling. During the time the river is impassable, passengers are transferred by steamboats and the perishable freight run *via* Lock Haven, Tyrone, Lewistown and Sunbury."

Southern Maryland.

This road is now being graded from Point Lookout northwestward about 50 miles to the intersection with the Baltimore & Potomac at, or near, Brandywine. It is expected that the road will be completed within a year, when it will afford an outlet from Baltimore to Point Lookout, where it is expected facilities for a coal trade may be found. It will be the first railroad in the narrow peninsula between the Potomac and the Patuxent.

Cleveland, Columbus, Cincinnati & Indianapolis.

The following is the list of stations on the new Cincinnati & Springfield Short Line, which has just been opened: Indianapolis, Cincinnati & Lafayette Junction, Brighton, Cumminsville, Spring Grove, Ludlow Grove, Race Track, Carthage, Hartwell, Lockland, Sharon, Chester, Maud's, Hughes, Munroe Reed's, Middletown, Franklin, Miamisburg Carrylton, Alexanderville, Dayton, Third Street, Draw Bridge, Harries', Harshman, Kneisley's, Osborn, Enon, Snyder's, Springfield, Lagonda Switch, Moorfield, Gravel Pit, Catawba, Mechanicsburg, Irwin, Milford, Marysville, Dover, Ostrander, White Sulphur, Sandusky Street, Delaware.

Wells & Northwood.

The Wells, Minn., *Atlas* announces the organization, in that city, of a new company to build a railroad from Wells southeast to Northwood, the present terminus of the Iowa Central Railroad. The distance is 30 miles, and it is estimated that the grading will cost about $90,000. Local aid will be asked to that amount.

Milwaukee & St. Paul.

The long trestle-work on the Iowa & Minnesota Division, between Mendota and St. Paul Junction, is now being filled up. There is about 500 feet of it, averaging 25 feet in height, and the work will probably occupy the time of 75 men employed three or four months. A solid arched culvert, for a roadway, under or through the filling, is now nearly finished, being some 60 feet long and 20 feet high, with walls eight feet in thickness on each side. The cost of this culvert will be about $15,000.

Baltimore & Potomac.

This railroad was opened for traffic from its temporary station in Baltimore, to Washington, with the staff of officers of the Northern Central Railway. At the same time the Alexandria & Fredericksburg Railroad was opened from Alexandria down the Potomac to a junction with the new branch of the Richmond, Fredericksburg & Potomac Railroad at Quantico, and at the same time the Northern Central's officers took possession of the old Alexandria & Washington Railroad, which the Baltimore & Potomac people have recently purchased on lease, and which connects the other two lines, giving a through line from Baltimore to Quantico, and as the Richmond, Fredericksburg & Potomac Railroad is

operated by allies (the Southern Security Company) there will be no obstacle to running trains through from Baltimore *via* Washington to Richmond, and, for that matter, to Wilmington, N. C.

The Philadelphia *Inquirer*, however, says:

"Owing to the refusal of the Fredericksburg & Aquia Creek line, which the Pennsylvania Railroad Company connects with at Fredericksburg, to connect with them but once a day, until the Pennsylvania Company can control a line of their own into Richmond, only night trains will run from here to and from Richmond, and the day trains are to keep up the old boating arrangement, continuing the seven hours' run to Richmond, instead of three."

Chicago, Burlington & Quincy.

This company is offering a new loan of 7 per cent. bonds in the New York market at par. Scarcely any other American company has a better basis for a loan either in the value and productiveness of its property, or the strict integrity and stability of its management.

Portland & Rochester.

The city of Portland, Me., voted again, on June 29, on the question of loaning the credit of the city to this company. The election resulted in favor of the proposition by over 200 majority.

Muscatine Western.

A telegram from Muscatine, Iowa, of July 1, says: "An excursion train runs this evening over the Muscatine & Western Railroad to the Iowa River, 26½ miles. This portion of the road has been wholly built in 70 days, the contracts for building it having been let on the 20th of April. Taking into consideration the unfavorable weather of the spring and the difficulties encountered on the line of the road, it is believed that this is the most expeditious railroad work ever done in the State. A Howe truss bridge, 624 feet long, over Cedar River, was put up in twelve days by the American Bridge Company of Chicago. During the last 36 hours, eight miles of track have been laid on the road by the Burlington, Cedar Rapids & Minnesota Railroad Company, which company is ironing the road.

Texas & Pacific.

This company has made the following proposition to the city of Jefferson, Texas:

"That twenty-one acres of land be given for depot purposes. And, in addition, that $300,000 in bonds bearing 8 per cent. interest annually, as follows: $200,000 in bonds of the city, and $100,000 in bonds of the county of Marion.

"The company agree to commence operations in ninety days from the acceptance of the proposition. That the said Texas & Pacific Company bind themselves to build on contract said road from Marshall to the east bank of the Sulphur River, within fifteen months, or by the 1st day of October, 1873."

This proposition was accepted, except that it is desired to substitute $125,000 in county and $175,000 in city bonds for the $100,000 in county and $200,000 in city bonds, the total amount, $300,000, remaining the same.

A contract has been made with Boffinger & Pegram for the transportation to Shreveport of all articles required in the construction of the road, from all points on the Mississippi River and its tributaries.

It is reported that the Vice-President, Col. H. G. Stebbins, is endeavoring to negotiate a loan for this road in Europe. The large grants of land owned by the company, much of which is valuable and can be sold, probably, quite briskly as soon as the road is completed through it, will give a better basis for a loan than most lines so far west can present.

Norfolk & Southern.

A Richmond correspondent of the Norfolk *Journal* says that this company, which proposes to build a railroad from Norfolk to Charleston, S. C., has been organized by the subscription of a sufficient amount to meet the requirements of the charter and the election of officers. General Charles B. Stuart, of New York, is President; General Charles G. Dahlgren, of Mississippi, Vice-President, and Mr. Arthur Holmes, of New York, Counsel. The next meeting of the board is to be held in Norfolk, subject to the call of the President. General Stuart is the Chief Engineer of the proposed New York West Shore & Chicago Railroad.

Peoria, Atlanta & Decatur.

The contract for track laying on this road has been let to the Toledo, Peoria & Warsaw Railroad Company, and work is to be begun at once.

Mansfield, Coldwater & Lake Michigan.

There is now 17 miles of new iron laid in the State of Michigan on this line, with five miles more on the ground. A train-load reached Mansfield Monday last, which was immediately spiked down. The entire line, we are informed, will now be completed as fast as it can be laid, as the iron is arriving daily, notwithstanding reports to the contrary.

Des Moines Valley.

The Des Moines *Register* of June 29 says:

"The trustees of the second mortgage on the Des Moines Valley Railroad have dismissed the suit in the Circuit Court of the United States for this State and commenced a new suit in the Circuit Court of Polk County, Iowa. It is said this change of base was made because the federal court could not get jurisdiction of some of the parties who were deemed necessary to the proceeding. The new suit is brought by John Fyffe, Esq., of Keokuk, and Withrow, Gatch & Dwight, of Des Moines, for the second-mortgage bondholders. It is understood that Strong & Springer, of Burlington, will represent the railroad company; Grant & Smith, of Davenport, the first-mortgage bondholders; Nourse & Kauffman, of Des Moines, the Des Moines Navigation and Railroad Company, and the holders of certain mechanics' liens, and Gilmore & Anderson, of Keokuk, some of the judgment creditors. The first-mortgage bonds amount, with interest, to over $5,500,000; their second-mortgage bond to nearly $4,000,000, the mechanics' lien to about $60,000, and the other claims we know not how much. The property consists principally in about 250 miles of railroad, extending from Keokuk by way of Des Moines to Fort Dodge, and several hundred thousand acres of land granted by Congress and the State to aid in the construction of the road. There are 23 defendants named in the notice, and these, with the force of lawyers employed, may increase as the trial progresses. The first engagement of the campaign will be at the September term of Judge Mitchell's Court, unless somebody grows impatient and brings on a fight in vacation."

Atlantic & Lake Erie.

The Columbus *State Journal* says that the directors of this company have resolved to put on a large force on the Southern end of this road to work from Pomeroy, on the Ohio River, northward. On this end of the line there is some pretty heavy work, including a tunnel 1200 feet long.

Lexington & Big Sandy.

This road is now completed to Mt. Sterling. Messrs. Bibb, Huston & Tabler, who have the contract for grading, masonry and track laying, having reached Mt. Sterling two weeks ahead of the time required.

Milwaukee & Northern.

Over twenty miles of this road is graded north of Plymouth, and a large force is now at work near Wrightstown, on the Fox river. It is said that the company has purchased iron enough to lay the track to Menasha. This iron is on the way, and it is expected that track laying will soon begin. Brown County has refused to exchange $75,000 in county bonds for an equal amount of stock in the company. The vote in favor of the proposition was 20 short of the required number.

Wisconsin Central.

This company has leased the Milwaukee, Lake Shore & Western Railroad, now in course of construction from Milwaukee up the shore of Lake Michigan to Manitowoc and thence westward to Menasha, the present eastern terminus of the Wisconsin Central. This line will be about 130 miles long, and will make the Wisconsin Central complete from Milwaukee to Lake Superior.

Pacific of Missouri.

A lease of the Pacific Railroad of Missouri to the Atlantic & Pacific Railroad Company has been practically consummated. The lease is for 999 years; the lessees guarantee a dividend of 5 per cent. for the first two years on double the present amount of the stock of the leased company, which now amounts to $3,635,750, a dividend of 6 per cent. for next two years, and after that a dividend of 7 per cent., payable semi-annually. They guarantee the interest on the bonded debt, which now stands at $10,000,000. We believe the Pacific of Missouri has never paid dividends, but it has made considerable expenditures in improving its property of late.

Southern Pacific of California.

Another section of twenty-five miles of this road was completed July 1, the terminus now being 260 miles from San Francisco.

Lake Shore & Tuscarawas Valley.

This railroad is now almost completed to Massillon, Ohio, and work on the grading is going forward between Massillon and Canal Dover, where junction will be made with the Pan-Handle road.

Belleville & O'Fallon.

Trains are now running regularly over this road, which is about six miles long, from Belleville, Ill., northward to O'Fallon, on the Ohio & Mississippi road. It is intended hereafter to extend the road to a point opposite Carondelet, and also in a northeasterly direction to Troy, on the Vandalia road.

New York Midland.

A portion of the Shawangunk Tunnel caved in on July 6. No one was injured, and the amount of damage done is not reported.

New Jersey West Line.

A locomotive belonging to this company was attached by the Sheriff of Union County at Summit, July 6, to satisfy a claim of $2,500 against the company.

Memphis, Carthage & Northwestern.

This road was opened from Pierce City, on the Atlantic & Pacific Railroad, 292 miles from St. Louis, northwest to Carthage, a distance of 27 miles, on July 4. It is intended to extend it west of Carthage into the southern tier of counties in Kansas.

Davenport & St. Paul.

The city of Davenport has refused, by a majority of 1,215, to vote a bonus to this road for the establishment of its repair shops at that point. It was asserted that there was no guarantee that the shops would be built, even if the money were voted.

Burlington & Missouri River in Nebraska.

Time table No. 8 of this road shows trains running as far west as Lowell, within nine miles of Fort Kearney and 15 miles of Kearney Junction, where connection will be made with the Union Pacific, 191 miles from Plattsmouth. This time table went into effect July 8. The part newly opened is from Howard to Lowell, 40 miles, in which the stations and distances from Plattsmouth are: Howard, 146; Inland, 146; Juniata, 158; Kenesaw, 166; Lowell, 176 miles. Thus this new line, next to the Union Pacific the most important in Nebraska, is very nearly completed. The distance from Chicago to Kearney Junction by this route will be 677 miles, whereas by way of Omaha and the Union Pacific it is 693 miles by the Burlington route, but though 679 by the Northwestern. The distance from Kearney is exactly the same (191 miles) to Omaha by the Union Pacific and to Plattsmouth by the Burlington & Missouri River road. The latter has a route of its own from Kearney to Omaha, which is 203 miles long. The new road might compete for the through traffic without difficulty, so far as distance is concerned, but as the Union Pacific controls the route west of Kearney, it will doubtless provide against any diversion of its through traffic by the new road, which, indeed, like most other roads, has very much more to hope from its local traffic than from any possible amount of through business.

New York Central & Hudson River.

The car-shop of the New York Central & Hudson River Railroad at West Albany, was partially destroyed by fire, July 6. In the paint shop were nineteen passenger cars, and two Wagner sleeping coaches, which were all destroyed. Six freight cars in the shop and thirty-one standing on the track outside were also destroyed, making the total loss on the cars $76,000, besides about $6,000 worth of freight, which was in the cars standing on the track. The loss on the building was about $20,000. The Wagner sleeping-coaches were insured for $5,000 each, which is the only insurance. The origin of the fire is unknown, but it is supposed to have been incendiary.

Burlington & Southwestern.

An officer of this company writes to us: "It is the intention of the Burlington & Southwestern Railway Company to extend their road from Moulton, Iowa, to Butler, Bates County, Mo., this season, passing through Unionville, Milan, Linneus, Laclede, Lexington and Pleasant Hill, all in Missouri. Track-laying will be commenced before the 15th inst. at Moulton, Laclede and Lexington. The distance from Moulton to Butler is about 143 miles. Preparations are also being made for construction from Unionville to St. Joseph. The line from Burlington to St. Joseph, *via* Unionville, is known as the Burlington & Southwestern Railway. From Unionville southward, by the name Linneus Branch of the Burlington & Southwestern Railway. The portion from Lexington southward, formerly known as the Lexington Lake & Gulf Railroad, is leased by the Burlington & Southwestern for a term of 999 years. A branch will also be built from Lexington to Kansas City.

Evansville, Henderson & Nashville.

We learn from the Evansville *Journal* that at a recent meeting of the directors of this company, and of the Edgefield & Kentucky Company, the transfer of the lease from the American Central Company to Winslow & Wilson was approved. A resolution in favor of consolidating the Evansville, Henderson & Nashville and the Edgefield & Kentucky companies with the St. Louis & Southeastern Railway Company was referred to the stockholders, who meet on the 29th inst.

Raritan Bridge.

An exchange says: "The contest between the Pennsylvania Railroad Company on one part and the Central (New Jersey) and Long Branch Railroad on the other, over the proposed bridge across the Raritan, has been settled, first, by assenting to a union bridge with sufficient draw for the commerce of the Delaware & Raritan Canal; and second, a union track from the river to the junction of the Perth Amboy & Woodbridge Branch of the Pennsylvania Railroad. By this arrangement the Central of New Jersey gets control of the line to Long Branch, connecting with the New Jersey Central at Elizabethport, and the Pennsylvania gets control of another all rail line to Philadelphia by way of Perth Amboy and Camden, a shorter and better route to and from Philadelphia and New York. The bridge and through route to Philadelphia will be running by January 1, 1873, and that to Long Branch by July 1, 1873.

The Perth Amboy *Democrat* says that this announcement is somewhat premature, as the case is still before the Chancellor, and the arguments are unfinished.

Peninsular of Michigan.

It is reported that a mutual understanding has been effected between this company and the Grand Rapids & Indiana Railroad, by which the latter leases the privilege of running its trains from Brady, Mich., 13 miles south of Kalamazoo, to Valparaiso, Ind., 44 miles from Chicago by the Fort Wayne road, on the Peninsular at certain rates per mile. They also agree to allow the Peninsular to run their trains from Valparaiso to Chicago on the Fort Wayne & Chicago track at the same rate per mile for each car. They also, as a part of this contract, furnish a large sum of money, taking as security the first-mortgage bonds of the road, and apply the amount which the Peninsular may earn from their cars running over the road to the extinction of the interest and principal of the debt. If this agreement is made, it will probably put an end to the Chicago & Mackinaw project.

Paris, Neoga & St. Louis.

This company filed its certificate of incorporation with the Secretary of State of Illinois July 1. The capital stock is to be $2,400,000, and the principal office is at Neoga, Ill. The route resembles that of the Vandalia line, being about 12 miles north of it at Paris, and approaching till it meets it at East St. Louis.

Buffalo & Jamestown.

Mr. Ewing, Chief Engineer, writes as follows: "We have our preliminary line now complete to the Pennsylvania State line, in the valley of the Little Brokenstraw, *via* Gowanda, Cherry Creek and Jamestown, and I find that our maximum grades from the State line north do not exceed 26 feet per mile, and southward 45.

Indianapolis, Bloomington & Western.

At a meeting of the stockholders of this company, held at Urbana, Ill., June 28, the directors were empowered to purchase the Havana, Mason City, Lincoln & Eastern Railway Company's rights and franchises, and to issue stock in the Indianapolis, Bloomington & Western Company to the stockholders in the road about to be purchased. In order to make this purchase and necessary issue of stock, the capital stock of the company was ordered to be increased to $15,000,000, divided into shares of $100 each, and the vote on the adoption of the necessary resolution stood 40,105 shares in the affirmative to 1,450 opposed. The present amount of stock is $5,000,000.

This company, in conjunction with the Peoria & Springfield Railway Company and the Peoria Elevator Company, has just invested $99,000 for land on the river front at Peoria, whereon to build elevators, depots, etc.